DOCUMENT RESUME

ED 261 679 IR 051 249

AUTHOR	Nielson, Brian; And Others
TITLE	Educating the Online Catalog User: A Model for Instructional Development and Evaluation. Final Report. Revised.
INSTITUTION	Northwestern Univ., Evanston, Ill. Univ. Libraries.
SPONS AGENCY	Council on Library Resources, Inc., Washington, D.C.
PUB DATE	5 Jan 85
CONTRACT	CLR-2055
NOTE	196p.
PUB TYPE	Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	*Academic Libraries; Higher Education; *Instructional Development; Library Automation; *Library Catalogs; *Library Instruction; Library Research; Library Skills; *Online Searching; Online Systems
IDENTIFIERS	Library Users; *Online Catalogs; *Transaction Log Analysis

ABSTRACT

This report describes efforts by three academic libraries to develop a model instructional program for online catalog users that could be adopted in other academic libraries. A key component of the research included the exploration and development of a methodology for utilizing online transaction logs to evaluate user performance. The four project objectives were: to develop a model for online catalog instruction based on a set of systematic and generalizable instructional objectives; to implement an instructional program based on the learning objectives at Northwestern University; to evaluate the success of this program through a variety of evaluative techniques, including transaction analysis; and to assess the utility of transaction log analysis as a means for instructional evaluation. The five-part report includes: (1) a review of the project's objectives and some of the underlying issues that prompted this study in online catalog user education; (2) a description of the establishment of learning objectives--the framework upon which the model program is based--as well as the model itself, and a review of the process for determining generalizable objectives through collaboration among the three participating libraries; (3) a detailed description of the research design and evaluation methodology used in determining the effects of an instruction program on the model as implemented at Northwestern University; (4) the evaluation findings and principal research outcomes of the project; and (5) the principal conclusions, some general observations on the research process, and suggestions for further research. The instruments used to gather data on user performance are described and included. An extensive bibliography is among the 10 appendices included. (THC)

ED261679

IR051249

ED261679

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

EDUCATING THE ONLINE CATALOG USER:

A MODEL FOR INSTRUCTIONAL DEVELOPMENT AND EVALUATION

FINAL REPORT

to the
Council on Library Resources, Inc.

CLR Grant No. 2055

Brian Nielsen
Principal Investigator

Betsy Baker
Project Coordinator

Beth Sandore
Research Assistant

Northwestern University Library
Evanston, IL 60201

January 5, 1985
(revised)

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Brian Nielson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR051249

TABLE OF CONTENTS

CHAPTER ONE: Project Overview 1

CHAPTER TWO: A Conceptual Framework For Teaching Online Catalog Use, by Betsy Baker 13

CHAPTER THREE: Design of the Study 37

CHAPTER FOUR: Findings 67

CHAPTER FIVE: Conclusions 91

APPENDICES 103

APPENDIX ONE: Learning Objectives for Online Catalog Education 104

APPENDIX TWO: Model Program Materials 112

APPENDIX THREE: Educating the Online Catalog User General Presentation Outline 117

APPENDIX FOUR: TEST ONE 125

APPENDIX FIVE: TEST TWO 142

APPENDIX SIX: Telephone Recruitment Interview Schedule . . 158

APPENDIX SEVEN: LUIS (Library User Information Service), A Brief Description 160

APPENDIX EIGHT: Project Bibliography 166

APPENDIX NINE: Project Reporting Activities 176

APPENDIX TEN: Summaries of Meetings with Librarians at Northwestern University, the University of Wisconsin-Madison and Washington University 177

CHAPTER ONE: Project Overview

Although there has been a steady pace of technological development in American libraries at least from the mid-1960's, only recently has the field progressed to the point of introducing online catalogs to the general public. Public service librarians, though well-acquainted with automated bibliographic retrieval through over a decade's experience with remote online databases, were faced with a completely new challenge when users were able to access the library's principal database independently. This challenge was two-fold. First, it required expanding traditional professional skills to accommodate this new and vital enhancement. Second, with this new aspect of librarianship a parallel challenge was and continues to be how to introduce this library tool to the user community. This report describes a research effort involving three academic libraries to develop a model instuctional program for online catalog users which could be adopted in other academic libraries. A key component of the research included the exploration and development of a methodology for utilizing online transaction logs to evaluate user performance.

This report consists of five chapters and ten appendices. This first chapter begins with a review of the project's objectives and a look at some of the underlying issues that prompted this interest in online catalog user education. The establishment of learning objectives, the framework upon which

the model program is based, as well as the model itself, are described in Chapter Two. Chapter Two also includes a review of the process of determining generalizable objectives through collaboration among the three participating libraries. The value of stated objectives in determining instruction content is discussed. Chapter Three provides a detailed description of the research design and evaluation methodology used in determining the effects of an instruction program based on the model as implemented at Northwestern. This chapter also serves to describe the instruments used to gather data on user performance with an online catalog, including both the written instruments and the transaction logging. Chapter Four reports the evaluation findings, the principal research outcome of the project. In the final chapter are to be found the study's principal conclusions, some general observations on the research process, and suggestions for further research needed in this area.

Project objectives

This research project, entitled "Educating the Online Catalog User: A Model for Instructional Development and Evaluation" has involved a collaborative effort among public service librarians in three academic research libraries -- Washington University, the University of Wisconsin-Madison, and Northwestern University -- though the bulk of the work has been carried out by Northwestern University, the institution funded by CLR to undertake the study. Northwestern University Library was

especially well-suited as a research site because the library staff had been experimenting with online catalog user education since 1981, and the library had available a facility for recording online catalog user transactions. This facility, which had promise of application for user education instructional evaluation, was developed with the support of an earlier CLR Bibliographic Services Development Program grant.

The four project objectives were: 1) develop a model for online catalog instruction based on a set of systematic and generalizable intructional objectives for teaching online catalog use which could be adopted by other academic libraries; 2) implement an instructional program based on the learning objectives at Northwestern; 3) evaluate the success of this program through a variety of evaluative techniques, including transaction analysis; 4) assess the utility of transaction log analysis as means for instructional evaluation.

The central question which directed this study was: What might be the components of a model program to instruct users of an online catalog? This question challenges a commonly-held view within the field of librarianship and information science that an effective "user-friendly" interactive computer system such as an online catalog, should not require instruction at all: Why teach the use of a tool that is putatively designed to teach itself? Instruction embedded in the system as part of its interface --

through introductory and help screens, through user prompts and labeling conventions -- it is often argued, should provide all that even the naive user needs to know in order to use that catalog effectively. Carried to what might appear to be its logical next steps, holders of this viewpoint could propose that efforts to develop an instructional program for an online catalog indicate that the online catalog is not fulfilling its purpose. Beyond that, such efforts arguably may inhibit possible improvement of the online catalog by forcing users to adjust to the inadequacies of the system rather than improving the system to meet users' needs on their own terms.

Though this research from its inception has questioned this view of the incompatibility of "user-friendly" online systems and instruction programs, neither has the contrary view, that instruction must be given to online catalog users, been embraced. We have proposed the creation of a model program for the following reasons:

1. There is wide recognition that the perfect online catalog does not (yet) exist.
2. Many librarians perceive that the online user interface may not accommodate all user needs at present, and may never do so.
3. The pace of change in interface improvements can often be painfully slow once any online catalog system "works" in the sense that it meets managerial (not user) criteria for "satisficing."

4. Numerous online catalog instructional programs have been initiated in many settings, particularly in academic libraries, making some effort at systematization of this instruction seem worthwhile.

Interactive systems for the general public are too new and too untested for us to assume simply either position without considerable experimentation and practical examination of what works and what doesn't work as these systems are introduced.

The research reported here, sponsored by the Bibliographic Service Development Program of the Council on Library Resources is intended as a response to a recognition from the field of academic librarianship that a careful investigation of online catalog user education is needed.

In January of 1983 the Council sponsored a small conference entitled "Training Users of Online Public Access Catalogs". (1) Presenters at the conference, including Evan Farber, Douglas Ferguson, and Christine Borgman, reviewed the current status of catalog training in academic libraries, the recent research on user responses to the new online catalogs, and the growing body of research findings on the impact of training on online retrieval systems users. Along with the more formal presentations, a number of librarians representing both public and academic libraries discussed their early experiences with online catalog user education programs, sharing details on techniques for orienting users, on the production of printed

guides, and ideas on likely developments in this new and exciting area of public services. Among the recommendations coming out of the conference were a call for research on the effectiveness of online catalog user instruction and the creation of a mechanism to share experiences in training users.

Conflicting Views on the Value of User Training

The issue of the value of user training has a long history which precedes the development of online systems. (2) This activity has been particularly intensive within academic libraries within the past 15 years, stimulated especially by the Council on Library Resources' College Library Program of the early 1970's. Out of this activity has come a more widespread awareness of the need to apply sound techniques developed out of educational research for the design and evaluation of instruction. The recent promulgation of a set of model objectives for academic library user education programs,(3) of a growing number of textbooks and other secondary literature,(4) and of the Association of College and Research Libraries' activism in building ties with academic associations(5) attests to the importance which academic librarianship attaches to bibliographic instruction.

Concurrent but rather removed (until now) from these developments in user education, automation system designers worked to apply significant advances in computing technology to information retrieval problems. In 1972 operational online

bibliographic searching systems became commercially available, but because of their complexity were adopted almost exclusively in library settings where librarian "intermediaries" could be trained to operate the systems on behalf of users. More recently this technology has been modified and adapted to create online catalogs. Because a central design feature of card catalog technology had been the creation of a system by which library users could meet their book-finding needs without aid from librarians, adoption of this "user-friendly" design criterion to a machine environment has been a high priority in online catalog design. This priority attached to "user friendliness", as valuable as it is for spurring on a variety of useful innovations, may not preclude incorporating online catalog user education into an integrated bibliographic instruction program. Just as present card catalog users require instruction in the organization and access techniques of library information, online catalog users will require this background instruction in addition to instruction which is particular to an online catalog.

Conflicting recommendations on the value of user training emanating from a number of online catalog studies recently funded under Council of Library Resources auspices illustrate how the field is divided on online catalog training. The studies, collectively referred to as the "OPAC" studies (for Online Public Access Catalog), were done by a number of agencies in 1980-82, coordinated by the Council. The University of California

Division of Library Automation report on the overall findings of the multi-institutional study{6} included as a conclusion "To improve user satisfaction with the online catalog, improve the system, not the users' training" (Executive Summary, page x), a sentiment shared by many online catalog developers. On the other hand, the J. Matthews and Associates study reporting on a subset of the data analyzed by the Berkeley group{7} had among its conclusions "there is a real need for the library to provide clear instructions on how to use the computer catalog and how the user can solve problems encountered during a search" and "Libraries with online catalogs must devise a coordinated program, perhaps using a slide tape or video tape program, to aid in assisting library patrons in learning to use the computer catalog" (Executive Summary, page x). Still a third study reporting on questionnaire results for the Research Library Group participants in the national survey,{8} which gathered data drawn from staff interviews as well as the standardized questionnaires of the other studies, noted findings which highlight the rift between online catalog developers and reference librarians: "Library staffs interviewed observe that users have more apprehensions about public online catalogs and request more staff assistance than the survey data may suggest. Staff feels many users experience substantial difficulty in learning to use the catalog" (Executive Summary, page v).

In addition to the work sponsored by CLR, two studies of

patterns of use in an online catalog suggest the importance of instruction in successful searching of online catalogs. Mary Gouke and Sue Pease of Ohio State University investigated patterns of use in an online catalog and a card catalog. In the first study,{9} they compared patron success in finding the same group of titles in both the online catalog and in two departmental library card catalogs. They found that patrons located titles more successfully and quickly in the departmental card catalogs than in the online catalog. Gouke and Pease found that while patrons preferred the online catalog, they were not able to fully utilize the searching power of the system. The researchers suggest that instruction is needed, particularly instruction for "problem" searches.

In a follow-up study{10} Pease and Gouke examined patron searches of actual titles in the Union Card Catalog at OSU and the online catalog. In this study the researchers found that the online catalog was more successful in locating materials and that an overwhelming majority of online catalog users preferred the online catalog to the card catalog. In this study, however, a group of individuals was identified who tried the online catalog and then returned to card catalog use because they felt a general lack of confidence in their online catalog searching ability. The identification of former online catalog users is quite significant. It is especially significant to note that the CLR online catalog user studies <u>systematically excluded</u> this group of

"former users" from their data collection. In this study as well, Pease and Gouke found that lack of instruction was expressed by library patrons as a factor contributing to their non-use of the online catalog.

Several conclusions may be drawn from these research studies. Both the CLR and the Gouke and Pease studies confirmed that online catalogs are generally popular and are accepted by the majority of library users. Users are also generally pleased with their searching results, and even non-users have a favorable attitude about the catalogs' likely ease of use. However, the studies do not agree on the importance of instructional programs. While some of the CLR studies suggest user education is not important, the second Gouke and Pease study, which identified a type of user systematically excluded from the CLR studies, showed that a need does exist for training in online catalog use. These conflicting conclusions combined with recommendations coming out of the CLR conference suggested that research to determine what real success a formalized online catalog instruction program may have, using data which has intrinsic validity to online catalog developers, was in order.

NOTES

{1} Training Users of Online Public Access Catalogs: Report of a Conference Sponsored by Trinity University and the Council on Library Resources, edited by Marsha Hamilton McClintock. Washington: CLR, 1983.

{2} Samuel Rothstein, "Reference Service: The New Dimension in Librarianship", College and Research Libraries 22:11-18, January 1961; Anita Schiller, "Reference Service: Instruction or Information" Library Quarterly 35:52-60, January 1965; Harvie Branscomb, Teaching With Books. Chicago, Association of American Colleges, 1940; Robert Wagers, "American Reference Theory and the Information Dogma", Journal of Library History, 13:265-281, Summer 1978.

{3} "Toward Guidelines for Bibliographic Instruction in Academic Libraries", College and Research Library News, May 1975, 137-39, 169-71.

{4} Cerise Oberman and Katina Strauch, eds., Theories of Bibliographic Education: Design for Teaching. NY: Bowker, 1982; James Rice, Teaching Library Use: A Guide for Library Instruction. Westport, CT: Greenwood, 1981; Anne Roberts, Library Instruction for Librarians. Littleton, CO: Libraries Unlimited, 1982.

{5} Carolyn Kirkendall, "Integrating Libraries in Higher Education: Publicizing B.I.", College and Research Library News, January 1983, pp 1+ .

{6} "Users Look at Online Catalogs: Results of a National Survey of Users and Non-Users of Online Public Access Catalogs", Berkeley, California, November 16, 1982.

{7} "A Study of Six Online Public Access Catalogs: A Review of Findings", Grass Valley, California, November 1982.

{8} "Public Online Catalogs and Research Libraries", Stanford, California, September 1982.

{9} Mary Noel Gouke and Sue Pease. "Title Searches in an Online Catalog and a Card Catlog: A Comparative Study of Patron Success in Two Libraries", Journal of Academic Librarianship. July 1982, pp.137-143.

{10} Sue Pease and Mary Noel Gouke. "Patterns of Use in an Online Catalog and a Card Catalog", College and Research Libraries, July 1982, pp.279-291.

CHAPTER TWO:

A Conceptual Framework For Teaching Online Catalog Use, by Betsy Baker

The advent of library automation has posed many challenges that have resulted in numerous changes both in public services and in technical processing in our libraries. In many situations, it seems as though the online catalog is the most visible sign of these changes. One clearly emerging trend in public services is the development of instructional services of various kinds to teach the use of the online catalog. These services have appeared in many forms, from concentrated design of online tutorials that require virtually no prior library or automation experience of the user to intensive publicity and orientation programs. (1) This paper will describe an aspect of research conducted at Northwestern University Library that was designed to develop and evaluate a model of online catalog instruction. The study, entitled "Educating the Online Catalog User," was funded by the Council on Library Resources. Librarians at Washington University in St. Louis, the University of Wisconsin-Madison, and Northwestern University collaborated in the early stages of the project contributing to the conceptual framework for teaching use of the online catalog. A central goal of the research was to provide an instruction model based on a set of generalized learning objectives for teaching and evaluating online catalog use that could be modified and adopted by other academic libraries. This first step in exploring

competencies for online catalog use may serve as a useful beginning as libraries assume an increasingly active role in accommodating user needs of various automated services. In particular, it is hoped that the product of the experiences of the three libraries involved in this study may prove helpful to others as they begin the necessary planning to integrate a new and vital tool in public services.

Because the development of generalizable learning objectives was only one part of the CLR project, this paper will begin with a brief synopsis of the larger study, including a capsule description of Northwestern's NOTIS system. Following this will be a review of the role of objectives in instructional planning, paying particular attention to the value of using objectives in determining instructional content. The process of collaboration with colleagues in establishing these objectives will then be discussed, making special reference to the importance and mutual benefit gained from the project's participating librarians. Finally, issues that surfaced as a result of this collaboration, issues which ultimately formed the guiding principles for the development of the model program, will be presented.

The CLR Project

Northwestern University Library began to develop the NOTIS (Northwestern Online Total Integrated System) system in the late 1960's. It currently provides a number of library materials handling features, including acquisitions, cataloging, serials

control, circulation, and an online catalog, called LUIS (for Library User Information Service). The system utilizes the full MARC format, runs on IBM or compatible mainframes in the 43xx series, and is now installed in a number of academic and public libraries in the U.S., as well as two Latin American national libraries. The LUIS online catalog component was introduced in 1980 with author and title access and enhanced in 1982 to add controlled-vocabulary subject access.

The initial design philosophy for LUIS was to have all instruction available in the system itself, through introductory and help screens. Although a single sheet handout was provided from the first to give some "offline" printed instruction in using LUIS, it was only over time that public services staff at Northwestern became aware of additional instructional needs. Staff members found themselves spending more time than expected assisting users of the online catalog. There was also a growing awareness that it was unrealistic to expect one method of instruction--no matter how good the method might be--to meet the needs of a user community containing a diverse population with various learning styles. Reference librarians felt that introductory and help messages were not extensively used by patrons having catalog difficulties. Through a series of service innovations, the Reference Department gradually consolidated the instructional experiences of its librarians into LUIS Workshops, informal sessions providing users with the basics of LUIS.

Northwestern worked to develop a means to evaluate and share with others what had been done locally. This chapter reports on the work of establishing formalized learning objectives for online catalog user education, objectives which may serve as a model for development of pograms in other academic libraries.

Learning Objectives

In order for a model online catalog user education program to be applicable to a variety of institutions, and for the program to be formally evaluated, it is critical that the program's learning objectives be stated and generalized beyond those associated with a particular system.

The first step in the execution of this research project involved formalizing the learning objectives which would serve as the basis for teaching and evaluating instructional methods in online catalog use. Basically, objectives serve three important purposes:

1. They help instructors select appropriate learning experiences.
2. They communicate to learners what is expected.
3. They give both students and teachers standards for evaluating progress. {2}

Establishing learning objectives is an essential step in instruction planning, since it is the objectives that specify the expected outcome of the instruction activity. However, much of the literature concerning bibliographic instruction has

emphasized the functional, administrative, and political aspects of establishing an instruction program, with little information about how to organize the content or the specific behavior expected of students as a result of the learning activity. We are unfortunately not in the habit of writing down objectives for most operations, and while few would dispute the desirability of stated objectives for all learning programs, the effort and energy required to formulate and produce useful objectives is often not available. One explanation for this type of development is provided by Anne Beaubien, Sharon Hogan, and Mary George, who note that many changes within public service areas of libraries are an attempt to meet "perceived user needs." Those needs are not often measurable because of the random and individualized nature of contacts between librarians and library users. (3)

In cases where learning objectives are developed for a specific library program, they are often conceived in a relatively insular environment. This type of development does not have the benefit of strengthening by objective review and refinement involving professionals from a number of libraries. The utility of constructive criticism through collaboration with individuals who possess considerable knowledge about the issue being explored is essential when libraries are struggling to determine effective means for introducing new services. For example, since many libraries today are now faced with the issue

of educating the online catalog user, much individual (and perhaps redundant) effort is being devoted by librarians across the country to developing related instructional services. The recently published ARL Spec Kit 93: User Instruction for Online catalogs in ARL Libraries provides numerous examples of materials prepared for these programs. Many of these programs are further described in the proceedings of the Council on Library Resources sponsored conference Training Users of Online Public Access Catalogs. (4) As seen in these publications, there are many approaches being explored, with most of the programs centering on local system applications.

If learning objectives are not stated for these programs, not only is it difficult to evaluate them, but it is virtually impossible to transfer any aspect from one online catalog environment to another. A failure to concentrate on the content and the objectives which form the basis of instruction and evaluation can leave librarians without a clear sense of what is to be accomplished in the activity. Charles McClure, in a paper delivered at the 1984 American Library Association conference,(5) emphasized the importance of careful planning for bibliographic instruction programs. He notes that often an instruction program fails due to inappropriate objectives for what the instruction was meant to accomplish, which ultimately inhibit effective planning and resource allocation. He also stresses the necessity of clear and measurable objectives as to what is expected to be

accomplished in a program. Since it is impossible to cover everything needed in an area, what are the most important elements in terms of activities to be accomplished?

Failure to state objectives may also lead to uncertainty in how best to organize an instructional session, ultimately causing student confusion over the expected outcome of the session. A presentation that is not carefully planned also prevents students from identifying the salient points of a learning session. Addressing such design issues early in the planning stages of an instruction program can help both the student and the instructor clarify the purpose of instruction.

The necessity of carefully planned objectives has been recognized within library organizations. As early as 1975, the Association of College and Research Libraries of the American Library Association develcped and published objectives for academic user education programs. {6} The Policy and Planning Committee of the ACRL Bibliographic Instruction Section is now revising these guidelines to reflect current growth, development, and trends in library instruction. More recently, the RASD Machine-Assisted Reference Section's Direct Patron Access to Computer Based Reference Systems Committee has drafted a statement of objectives for teaching use of online systems in general. {7} The availability of these broad objectives has assisted many librarians in the design of instructional programs. Although the committee process is quite useful for suggesting

professional guidelines, it is not a vehicle for timely evaluation of such guidelines because there is no immediate access to an operational test environment.

One of the objectives of this project was to create a "generic" instruction program, for which the objectives could be "customized" by each library. The focus of each library's evaluation will be determined by the instructional goals it chooses. Evaluation can then be performed within the library, including testing to determine whether students actually demonstrate knowledge of those points designated important. With a generic program as a goal, it was essential to look at online catalog instruction as it could be applied across many systems. In order to accomplish this, it was necessary to incorporate significant collaboration and review components into the program design.

Planning Principles

Several considerations were involved in the process of establishing broad-based objectives for an online catalog instructional program. The following discussion describes certain issues that were raised in the early design stages of the project. The resolution of these issues was important, as the objectives formed the basis for the development and eventual evaluation of the instruction model.

1. The first issue involved the role of collaboration in planning instruction. Specifically, the appropriate method of soliciting input from librarians and incorporating this input into the overall plan was a concern.
2. The second concern involved determining content of teaching activity, particularly as there has been controversy over whether to organize instruction around basic procedures for searching or to organize instruction around a conceptual model of the system.
3. The third issue, closely related to the second, involved determining the value of including information about system structure in an instructional activity.
4. Finally, the concern the library profession has placed on the issue of command standardization for online catalogs held a place of primary importance in the planning framework for this project.

With regard to the first issue, teamwork in program planning provided numerous benefits. The most obvious benefit that is achieved through collaborating with colleagues is the informal brainstorming process that stimulates innovative approaches and ideas. In planning the framework of instructional objectives for teaching the use of the online catalog, there was extensive discussion with librarians at Northwestern University, the University of Wisconsin-Madison, and Washington University. These discussions centered on identifying a set of ideal objectives, without linking them to features of specific systems or tying them to specific methods of instruction. It was felt that by focusing on general expectations of users of online catalogs--not simply expectations of users of specific systems--skills might more easily be transferred across many systems. It was through these discussions that the early instruction needs were determined and carefully considered by all participating librarians.

To stimulate discussion in these meetings with staff from all three institutions, draft statements of learning objectives were circulated with a request that written comments be prepared. The draft statements were written as explicitly as possible for the specification of desirable learning outcomes. As staff members read the draft statements and commented on them individually, many different viewpoints emerged. The unifying theme throughout these discussions was concern that the outcomes

would be those needed by the patron for successful searching of the online catalog. Efforts were made to specify outcomes that were observable and measurable, rather than stating outcomes using terms such as "understand" or "know" which do not lend themselves to easy observation.

Types of Objectives

A convenient and useful format for stating learning objectives was drawn from the ACRL Bibliographic Instruction Handbook. {8} In this framework, three types of objectives are identified: general, terminal, and enabling. A general objective is that goal for the overall instruction program. The general objective for the model online catalog instruction program included a realistic expectation of user performance:

> Upon completion of the instructional activity, a user should have an understanding of the function and scope of the onine catalog system and be self-sufficient in using computer catalog public terminals to perform non-problematic monograph and serial searches.

Terminal objectives (referred to here as program objectives) are goals for individual components of the overall program

> (e.g., Program Objective 4: The user is able to structure an online catalog search by correctly choosing, entering, and manipulating the appropriate search vocabulary.)

Program and terminal objectives are not measurable, but they can be broken down into highly specific and measurable tasks, which are termed enabling objectives. An example of one of the enabling objectives related to Program objective 4 is: "Given a choice between initiating an author, title, or subject search,

the user will select the most system-efficient search category for his or her information need. A full outline of the model statement of objectives which includes the program objectives along with the enabling objectives, appears as Appendix One of this report.

With this framework of objectives in mind, the evaluation of the program was designed to include two types of learning processes--behavioral and cognitive. Cognitive learning is closely linked to building a picture of how a system works. Behavioral measures are associated with the performance of specific tasks, which demonstrate that a user does indeed understand the principle or the model for which the tasks are applicable. For example, if a student can successfully identify the title of a book, its call number and location, and its circulation status, given only the author's name, that student has achieved the enabling objectives that show he or she has also attained a key terminal or program objective--correctly formatting and manipulating information in an online catalog search. Within the behavioral/cognitive framework, it is intimated that the student who has attained a program objective (behavioral aspect) has also developed the corresponding mental concepts about performing the specific tasks involved. Even with a set of learning objectives, constructing test questions to measure attainment of those objectives is a process that does not always assume that the corresponding correct mental concept is

being used. Within any testing situation, there is always the possibility that test results are linked more to the instruction than to the performance one is hoping to elicit.

As the logical steps in a search process were identified, there was some concern about use of language for the objectives. In general, the terminology of formal objective-writing can seem unduly rigid. Some staff members at Northwestern University Library felt strongly that it should not be necessary to adhere strictly to a behavioral approach that required a user to physically demonstrate knowledge of a specific system feature. This perception came from staff members, each with more than three years' experience working with students both informally and in group situations with Northwestern's online catalog. An approach combining cognitive principles along with behavioral measures was adopted, since the processes that were hoped to be elicited in online catalog users could not be completely categorized as either behavioral or cognitive. Of course, the more strictly the objectives are operationalized, the easier it is in the long-run to evaluate user performance. However, requiring a user to list, for instance, all of the steps involved in executing an author search seemed to be an artificial measure of that performance. One would only be testing the user's ability to recall and recite procedures. On the other hand, it was impossible to obtain some quantitative measure of performance by simply asking a patron if he or she could perform successful

author, title, or subject searches. It became apparent that strict adherence to one approach or the other could lead to inflexibility and lack of coherence in the program that was being developed.

Adopting Educational Models for Teaching Online Catalog Use

The value of collaboration touches on another issue that is encountered on a broader scale in bibliographic instruction--promoting motivation and encouraging staff involvement. While this issue will not be addressed at length here, it was felt that the experiences with teamwork in this project provided an opportunity to deal with program planning at a level not often attainable for most situations. Without this large-scale multi-institutional planning, librarians may respond apprehensively to becoming involved in such a structured bibliographic instruction program, especially one based on educational models, using educational concepts with which they may be unfamiliar. Some discomfort may also arise when librarians are asked to plan a program, wherein they must assess the teaching results to determine whether the session has been effective. As an extension of reference services, bibliographic instruction has not often been subjected to careful evaluation of achievement outcomes. The advantage of drawing on such well-established and tested methods is the assurance that a similar library instruction program which includes components such as objectives, careful planning, and evaluation can be

continually modified and expanded to accommodate changing instructional needs. These evaluation techniques are useful on a practical level for administrative purposes, for assessing content, and to document and improve programs.

What to Teach

The inter-institutional sessions brought an awareness of the second and third issues--the conflict over what to teach--procedural knowledge or system concepts. More specifically, what technical and logical aspects of the structure of an online catalog system should be explained to users--how much must a user understand about file structure and the workings of information retrieval in order to successfully use an online catalog? Also, in what manner and in what depth should such concepts be incorporated as learning objectives in the instructional program?

The Online Catalog and the Card Catalog: Similarities and Differences

Throughout the program planning phase, the project principals were able to draw on bibliographic instruction programs developed for teaching use of the card catalog. In developing an online catalog instruction program, it is helpful to associate online catalog use with that of the card catalog, since they are both means for accessing a library collection (and, quite often, both must be employed to use the collection effectively). A conceptual framework that seems particularly

suited for teaching the use of the online catalog is to present a metaphor for the system, with the most obvious metaphor being the card catalog. While the purposes for using a card catalog and an online catalog are the same, the methods of obtaining author, title, subject, and holdings information do not necessarily presume the same approaches. Even in the case of a complex system, a conceptual framework can serve to reduce the initial perception of complexity by making reference to the familiar. The model can serve to highlight features of a system that may be the source of difficulty if misunderstood, such as the identification of searchable fields in a retrieval system (e.g., key-word or subject searching using Library of Congress subject headings).

However, while drawing on the card catalog as a means for presenting a metaphor, it is important to keep in mind that it would be misleading to assume that the online catalog is simply a "card catalog on wheels," and to promptly adapt our teaching programs accordingly. The analogy or methaphor must include differences as well as similarities between the two systems to be accurate. The most obvious differentiating feature between the online catalog and the card catalog is the interactive searching capability provided by the online catalog. {9} Moreover, the difference in indexing structures of the card catalog and the online catalog point out initial needs for fundamental changes in any card catalog instruction program. In addition to this

difference, users must become familiar with operating a video display terminal and a keyboard for online catalog searching, which would constitute a completely new but basic component of any online catalog instruction program. Also, the importance of determining intellectual authorship for searching in the card catalog may not be as crucial when searching online catalogs which may provide additional access points.

Variation in Online Catalog Design

In addition to these variations between teaching card catalog as opposed to online catalog use, Charles Hildreth's comparative study of online catalog system features pointedly illustrates the fact that most online catalogs utilize unique searching techniques and command languages. {10} It was with this point in mind that the final issue was addressed, that of system feature standardization. Currently, considerable interest has been devoted to exploring means for standardizing search techniques and screen formats. Since many online catalog systems are developed in the private sector, a concerted effort to develop and employ standardized techniques does not appear imminent. (Perhaps the combined efforts of the Research Libraries Group, the Washington Library Network, and the Library of Congress in the Linked Systems Project will provide ultimate transferability of data without sacrificing individual system development). {11} Even if a common command language could be adopted, libraries will still be faced with educating users to

the scope and utility of the local system. {12} These key examples reveal fundamental conceptual differences that are a prerequisite for satisfactory online catalog use--general understanding of automated retrieval and file structure along with a proficiency in using computer equipment. {13} The focus of this project has recognized the need to teach a general and transferable concept of system use without diminishing the importance of including system-specific procedures. In fact, it is suggested that these techniques might be more easily acquired from instruction embedded in the system, once a conceptual model has been learned. One of the most important functions of the user interface has been to provide such procedural training. In working to develop a program for online catalog users, efforts were made to supplement past experiences with the card catalog in light of the above mentioned differences between the two approaches.

One such teaching approach involves presenting a model of system operations to the users. It has been suggested that if a model has not been presented in the learning activity, it is likely that the student will develop his or her own, possibly incorrect mental model of that system. {14} The value of teaching around a conceptual framework has been advocated as an effective means for organizing the content of instruction. {15} Teaching use of an automated system seems particularly suited to instruction organized in this way because of the

inter-relatedness of system functions. A person with a correct mental model has a conceptual understanding of the way the system works, and should ultimately perform better, especially with more complex searching techniques. A person with only procedural knowledge has learned a set of rules to apply in interacting with the system but has not organized these rules into a related framework for the system's functional operation. Such an individual may be more inclined to confuse the functions of similar commands when faced with the need to use more than one system. If the student has been presented with a conceptual overview, it is more likely he or she will be better prepared to conceptualize methods for using the system, and therefore may have fewer problems moving between systems. [16]

A teaching environment where this learning can take place should include overview information about the system and illustration of structure by example. Information about file structure and indexing that is not system specific may be easily generalizable to other systems. The LUIS system structure, being fairly simple, may not require much explanation of file structure in order for patrons to use it. There are, however, more complex systems where features such as Boolean searching and set construction may require considerable instruction and practice for effective searching.

Recent research on the ways humans interact with computers further supports the position of designing online catalog

instruction programs around some conceptual framework. Theoretical work has been done, and been supported in limited ways empirically, which suggests that people build mental models of a system whether instruction has been planned around a conceptual model of that system or not.

Conclusion

With so many automated systems, within and beyond the library environment, transferring skills learned about one system to another may prove problematic for many users. Further, users may encounter difficulty due to the nonstandardization of online system features. This era of technological development has caused some library services to appear fragmented and mystifying to users. {17} It is likely that more libraries will become multiple system members, with more than a single online system available for users. With this in mind, it becomes increasingly important for users to develop the skills to move with ease from the library's online catalog to other online files, such as OCLC, LCS, or RLIN. It is important to begin taking steps toward demystifying these library services by presenting information about the different systems in a similiar fashion.

The objectives that constitute the conceptual framework described here were developed for the purpose of online catalog instruction. In concept they are closer to teaching use of a card catalog than an information retrieval system. For patrons, online catalog use is simply a means of accessing a library's

collection. As such, learning online catalog use is a necessity, but not necessarily an interesting endeavor in itself. When the new tool is taught solely in terms of the old, it is not likely that sufficient challenge will be perceived by the user to sustain his or her interest in the learning activity. Once general principles of information retrieval are more fully integrated in our instruction programs, it may be more likely that such instruction would provide the needed challenge to users as well as providing the generalizable automated retrieval skills needed to move confidently between systems. This work in exploring the development of an instruction program to support an online catalog may prove most valuable as we attempt to incorporate instruction for other automated systems into our library programs. The challenge that we face as we take steps toward demystifying automated services is designing instruction programs that stimulate users' interest.

NOTES

{1} Chin-Chuan Cheng and Kurt R. Murphy. "The IBM PC as a Public Terminal on LCS," Information Technology and Libraries (March 1984); 62-68.

Training Users of Online Public Access Catalogs. (Report of a conference sponsored by Trinity University and the Council on Library Resources, San Antonio, Texas, January, 1983.) Washington, D. C.: Council on Library Resources, 1983.

{2} Julie S. Vargas, Writing Worthwhile Behavioral Objectives. (NY: Harper and Row, 1972).

{3} Anne K. Beaubien, Sharon A. Hogan and Mary W. George. Learning the Library. (NY: Bowker, 1982): 31.

{4} Association of Research Libraries, Office of Management Studies, ARL Spec Kit 93: User Instructions for Online Catalogs in ARL Libraries. (Washington: ARL, 1983)

{5} Charles R. McClure, "Planning and Organizational Issues for Effective Information Management Education." Presented at the 1984 ACRL BIS program, American Library Association Annual Conference, Dallas, Texas, June 26, 1984.

{6} "Toward Guidelines for Bibliographic Instruction in Academic Libraries," College and and Research Libraries News (May 1975); 137-39, 169-71.

{7} "MARS Committee Updates", RASD Update 5 (January/March 1984): 4

{8} Bibliographic Instruction Handbook. (Chicago: Association of College and Research Libraries): 35-45.

{9} Timothy F. Richards, "The Online Catalog: Issues in Planning and Development," Journal of Academic Librarianship 10 (March 1984); 4-9.

{10} Charles R. Hildreth, Online Public Access Catalogs: The User Interface. (Dublin, OH: OCLC, 1982).

{11} Research Libraries Group. 1983 Annual Report. (Stanford, CA: 1983).

Ray Deneberg and Sally H. McCallum, "RLG/WLN/LC Computers Ready to Talk," American Libraries 15 (June 1984): 400-404.

{12} Deborah Masters, "How Will the Online Catalog Affect the Reference Function?" paper presented at the New England Chapter/ACRL program, March 19, 1982.

{13} James E. Eisele, "A Case for Universal Computer Literacy," Journal of Research and Development in Education 14 (Fall 1980): 84-89.

{14} Christine Borgman, "Mental Models: Ways of Looking at a System," ASIS Bulletin (December 1982); 38-39.

{15} Pamela Kobelski and Mary Reichel, "Conceptual Frameworks for Bibliographic Instruction," Journal of Academic Librarianship 7 (May 1981); 73-77.

{16} Christine L. Borgman. "The User's Mental Model of an Information Retrieval System: Effects on Performance." (Ph.D. dissertation, Stanford University, 1983), p. 57.

{17} C. Lee Jones, "Library Patrons in an Age of Discontinuity: Artifacts of Technology," Journal of Academic Librarianship 10 (July 1984); 151-154.

CHAPTER THREE: Design of the Study

The development of instructional programs based on a series of generalizable learning objectives accomplished the first two objectives of the "Educating the Online Catalog User" project. A critically important subsequent step was evaluation of the effectiveness of the instruction, using both established evaluation techniques and a newer method made possible by the computer's special capability of producing a record of user behavior. This chapter provides an overview of the goals of the evaluation, a description of the experimental design that was devised to meet those goals, an explanation of the transaction logging procedures which were used as an aspect of data collection, and a description of the mechanics of enlisting subjects for the research and arranging the physical environment for gathering the data.

It must be made clear from the outset that evaluation of instruction in an area of performance skill or acquisition presents certain problems, long recognized by educators, inherent in the measurement process. Assessment of whether someone has achieved a particular level of skill at something can most easily be accomplished by asking him or her to do it, observing the performance, and then making a judgment on the quality of the task execution. Though this sounds simple, it is fraught with a number of difficulties. First of all, direct observation of more than a very few learners may require considerable time of an

evaluator, and beyond a fairly low threshold could get quite expensive. Second, the presence of the evaluator/observer may affect the performance in ways which are easily envisioned: the performer is made to feel self-conscious, the necessity of observation forces the performer to attend to display considerations, the evaluator may unwittingly communicate some positive or negative assessment through body language, and so on. Thirdly, the task assigned may not be fully representative of what is actually a range of closely similar but unique tasks that the evaluation assumes are comparable.

Because the objectives developed for online catalog instruction involved acquisition of both cognitive and behavioral learning, it was important to develop an evaluation strategy which addressed objective achievement in both areas. In addition, it was felt important to obtain information about the target population for the institution, including both demographic characteristics and certain attitudes that were held about the online catalog. And to achieve the project objective of determining the utility of transaction log data in instructional evaluation, a methodology involving actual online catalog use which could be monitored was also a requirement.

In early discussions about how an evaluation design could be accomplished, an additional issue arose which held considerable interest to the research and which presented a special conceptual challenge to public services librarians responsible for orienting

users to major bibliographic tools. This issue concerns cumulative learning. Because a library user in many cases may learn the use of a tool in stages, such as by trial use, then by assistance from a librarian, cumulative learning, or learning that builds on previous learning, frequently occurs. In the case of learning about a library catalog, cumulative learning is especially salient, for many users get instruction in use of the catalog in elementary school, often repeated again and again. Academic bibliographic instruction librarians are well aware of the problems inherent in this situation, for they often must help students "unlearn" what had previously been learned about the catalog. {1}

The concern with cumulative learning led to the development of an experimental design which allowed investigation in two areas: the effect of alternative modes of presentation of instruction in the online catalog, and the cumulative effects that may occur with the presentation of two instructional sessions. The experimental protocol is presented in Figure 3-1 on the following page. The protocol called for the creation of three experimental groups of subjects, each taking two tests, and two instructional treatments: a classroom-like presentation on the online catalog (the LUIS Workshop), and the reading of a printed brochure designed to convey the instructional content (the LUIS brochure). As the tests themselves required participants to use the online catalog in the answering of some

Figure 3-1: Experimental protocol

EDUCATING THE ONLINE CATALOG USER

Study Design

TIME SEQUENCE	GROUPS DAY 1 Control Group	DAY 2 Group A	DAY 3 Group B
Time 1	(nothing)	LUIS Workshop	LUIS Brochure
Time 2	TEST ONE	TEST ONE	TEST ONE
Time 3	(distraction)	LUIS Brochure	LUIS Workshop
Time 4	TEST TWO	TEST TWO	TEST TWO

of the questions, all three of the groups were exposed to use of the catalog and its introductory (tutorial) and "help" screens. The three groups were to be matched along demographic characteristics felt to be possible sources of variability in online catalog use skill. The two tests were composed of different but closely similar questions, so that in effect they were testing the same knowledge. Group One, a control group, was to take the first test, followed by a "placebo" presentation (in particular, a short non-instructional film) and then the second test. Group Two was to receive the live instructional session followed by the first test, then read the instructional brochure and take the second test. Group Three was first to read the brochure and take the first test, then have the instructional session and the second test. This experimental design allows for the comparison of three matched groups given different treatments on their performance with a single test, as well as for the examination of changes in performance within a single group following the presentation of a second treatment in order to test cumulative learning effects.

TEST INSTRUMENTS

With the experimental design established, the next step was the development of a pair of test instruments, designed to test user performance based on the learning defined in the objectives described in Chapter Two of this report. As noted above, the two tests were to be different in the specific content but to measure the acquisition of essentially the same learning material.

The test questions for accomplishing the evaluation goals of the study were developed to measure the attainment of specific objectives, and were modeled in format after the type of question long used in catalog instruction. The tests were divided into seven sections based on the type of content covered in the questions. On the cover sheet of each test booklet respondents were requested to enter their student identification number to enable the proper matching of tests for each student following the experiment. These tests are reproduced as Appendices Four and Five of this report

The first section in Test One contained a series of questions regarding demographic characteristics of the respondents, among the characteristics being age, sex, average grade in high school, and prospective major. Also asked in this section were the frequency with which respondents used the Northwestern online catalog and other online catalogs, their previous experience in using a computer, and their familiarity with computer programming and computer assisted instruction. These questions were not repeated in Test Two since the student identification number would serve as a link tying the two tests to an individual respondent. The remaining seven sections on both tests were parallel in content and format. The second section of the tests included terms and matching definitions. Instructions were given which requested that students not guess at answers but rather, leave the appropriate answer space blank

if unsure of a response. This section was divided into two parts. Part one included the matching of general terms associated with computer catalogs and which were believed to hold significance in the field of information retrieval such as "database," "online," and "search statement," with a corresponding definition. The second part of this section included definitions which referred to features used when searching computer catalogs such as "truncation," "bibliographic record" and "help screen." The following three sections were designed to measure operational knowledge of LUIS, which involved some paper and pencil questions as well actual use of the terminal. Since subjects' responses to the test were to be recorded not only through written responses on the test itself but also by the transaction monitoring, which recorded responses as subjects used the online catalog, sections four and five of each test required the students to use the online catalog. (The transaction logging facility itself is described in greater detail later in this chapter.) Respondents were asked to record on the test the identifier (a four-character alphanumeric code unique for each terminal in the Library, which appears in the upper right corner of the screen) of the terminals at which they were seated. The fourth test section included eight questions which were labelled "practice" questions to encourage active searching in the terminals, and required no written responses from the subjects. The second series of search questions

(section five), which required use of the terminal, asked that subjects write down responses based on what they found on the online catalog terminal. The purpose of this aspect of the design was to downplay the fact that students' responses were being monitored by a computer, giving the appearance that all the test data being recorded was on the physical test itself. Also, written answers could be checked against the transaction log output to determine whether the search strategy used to find the answer was correct. Section six of the tests included a paper copy of a screen display of a bibliographic record from the computer catalog. Students were instructed to match numbered items on the copy of the screen with the definitions provided. The last section of the tests included a series of attitudinal questions which were designed to assess student perception of the tests as well as attitudes about searching the computer catalog. These questions were the same on both tests.

Transaction Monitoring

This section describes the utilization of transaction monitoring as a data source for evaluation of the online catalog instructional program implemented at Northwestern University Library. Also described are the physical and organizational arrangements that were required to utilize the monitoring facility for purposes of instructional evaluation. The way the transaction log data were processed following the conclusion of the experimental sesssions, and how they were associated with the written test data, concludes the section.

Transaction monitoring or logging has been a commonly utilized technique for the study of interactive computer systems for years. The technique takes advantage of the inherent power of a computer to monitor its own activities and record on an attached information storage device (typically a disk or tape) aspects of its activity as generated by one or more users. An informative general overview of how transaction logs may be used in research is provided in Penniman and Dominick. {2} John Tolle and Ray Larson have provided useful descriptions of some of the first research work on transaction logs as they have been used with online catalogs. {3}

Northwestern University Library developed its transaction logging facility as a part of the NOTIS software system in 1981, in conjunction with the Library's involvement with other RLG Libraries in the CLR-sponsored OPAC study. {4} Many other online catalogs and interactive systems developed similar facilities during the same time period. However, there is currently no accepted standard for what data is recorded, nor for in what format it is to be recorded. There is also wide variation from system to system on the use of a logging facility.

With a computer fully dedicated to library processing functions and perhaps in part because specifications for the logging function were developed by public services staff, Northwestern's transaction monitoring collects more elements of online catalog transactions than most other systems currently in

use. The richness of the data itself has attracted interest both within and beyond the library, not only among those with special research interests in online catalog user behavior, but also among librarians in both technical and public service departments who are able to obtain what is almost a direct experience of looking over the shoulder of online catalog users.

In the context of the research reported here, the ability of a transaction log to be readily interpreted holds special significance. Observers of the general field of evaluation research have long recognized the great problem of how the products of such research are so seldom accepted among practitioners in the field. {5} One source of that problem is that the process of data analysis results in the reporting of outcomes which to the practitioner appear remote from experience: data analysis may be so abstract that relating its outcome to the "real world" may be difficult for the field practitioner. A data source such as a transaction log, in which the connection between the "real world" of the visible user's input into the online catalog and the processing of data is patent, may have the advantage of holding the interest of practitioners in evaluation research efforts.

The logging function automatically in use at Northwestern records nine elements or features of every time an "enter" or "clear" key is pressed at any public terminal in the system. In addition, eleven elements are recorded on the transaction log

each time the computer passes information back to a terminal in response to a user request. Both "input events" (user requests) and "output events" (computer responses) are recorded in the same format on the log, so that a record structure is created of events which can subsequently be "paired" into input and corresponding output transactions. The transaction log function has been in use since May of 1981. Daily and monthly summary reports have been produced from that time, providing counts of types of searches, the frequency of specific help screens being called, the number of searches performed on each public terminal, and other counts as well. Since early 1983 virtually all transactions have been stored on tape, and the library currently holds several million transaction records. The volume of this data varies by quarter, and can range from 3,000 transactions recorded per day during low activity periods, to over 7,000 transactions during peak periods.

Figure 3-2 on the following page details the specific information contained on each transaction log record. Northwestern's logging function is notable for its recording of all user input, including the content of search strings. The richness of this data enables researchers and others to learn a considerable amount about the behavior of online catalog users, and two studies have already been published which use Northwestern's logs. {6}

Each transaction is recorded on the log as it occurs, and

Figure 3-2: Field description

Terminal ID This is the code used to uniquely identify each terminal in the system. For dial-up lines, this represents a single port.

Date This is the date on which the event occurred. Julian form is used, with the last two digits of the year first, followed by the day of the year.

Time This is the time at which the event occurred. The 24-hour clock is used, with the hours in character positions 10-11, the minutes in bytes 12-13, the seconds in positions 14-15, and the tenths of a second in position 16.

Transaction ID (positions 17-20) This identifies the program which creates the record.

Task number (positions 21-25) This is the number used by CICS to identify a specific invocation of a program. In LUIS 3.1, many events may be associated with a single task number.

Attention ID (AID) (position 26) This code indicates whether the record represents an input event or an output event, and, for input events, shows which terminal key was used to signal the computer.

Screen ID This is the code used to indicate the type of data being displayed.

Error message ID This is the code used to indicate the messages being displayed at the bottom of LUIS screens. Currently the only messages displayed are "Invalid command code" and "Invalid Line Number".

Command code (positions 31-33) This is the code used to indicate the command entered by the user.

Number of hits (positions 34-37) This is the number of index records which matched the most recent search request.

Number of lines displayed (positions 38-39) This is the number of "detail" (not prompting) lines displayed on each LUIS screen.

MARC format (position 40) When bibliographic records are displayed, this code indicates the MARC format of the data: B = books; F = films; M = music; P = maps; S = serials; U = manuscripts.

Text of input (positions 45-120) For each input event, this is the exact data entered by the user.

thus transactions from all library online catalog terminals are intermingled. For the sequence of a user's inputs and system responses to be meaningful through visual inspection, the transactions within a given time period must be first sorted by date, terminal identifier, time and finally action identifier (to properly place input events ahead of output events in cases where the time recorded on input and output event records is identical).

As with most other online catalog transaction logs, Northwestern's monitoring facility does not enable an investigator to distinguish one online catalog user from the next when looking at a series of transactions from a single terminal. One can reasonably assume that not more than one user is at a terminal from the transaction initiating a new search until either a command clearing the search or beginning a new search occurs, but beyond that, associating a series of transactions with a single user is a matter of guesswork. A guess that an unsuccessful search for works by Samuel Clemens followed immdediately by a title search for The Adventures of Huckleberry Finn would be associated with a single user has a high likelihood of being true, but it is a guess nevertheless. Most series of searches entered by a user, we know from experience, are not so neatly related, of course. An interface requirement for each online catalog user to mark the beginnings and end of his or her session would avoid this monitoring limitation, but would both

make the catalog somewhat more troublesome to use and potentially introduce difficult issues concerning rights of privacy in online catalog use.

The collecting of transaction log data specifically for the instructional evaluation component of this research effort involves a design which would circumvent both of these problem areas. By recording transaction events generated by each research subject stationed at a single terminal for the duration of a testing period, sufficient control was placed on terminal access to allow clear delineation of one user from the next on the transaction logs. With this setup, marking the beginning and end of user sessions on the log is unnecessary. The privacy issue is avoided by using a structured testing process with predetermined search problems, rather than recording on the log search content which is user-generated. Under the Federal "Guidelines For Research Using Human Subjects", this type of experiment is nonproblematical and exempt from review.

Given the availability of the Northwestern University Library's computing resources, the researchers conducted the experiment under the assumption that the collection of transaction log data for this research was essentially automatic: All that was required was the installation of a sufficient number of terminals to enable the subjects exclusive access to them for the duration of the experimental period. Because the transaction recording is a constant process, the only post-experiment

activity which had to be done was the extraction from the log of all transactions that month those which had the appropriate terminal identifiers. An IBM sort/merge utility was used to accomplish both this extraction and the sorting of transactions by date, terminal identifier, time, and transaction identifier. A total of 9,814 records were extracted from the April log tape, representing over 4900 input events recorded from the subject population and an equal number of output transactions. These records were both transferred to a separate tape for subsequent machine processing and listed on paper for visual examination.

Unfortunately, the assumption of automatic recording was overly optimistic, and the actual results of the transaction log analysis were compromised by the loss of all transactions on the first day of data collection, representing the transactions of the control or non-treatment group. The reason for the loss of what was perhaps 4,000 transactions was due to a combination of operator error in the Library's Data Center, and unusually heavy online catalog use in mid-April when the experiment took place and is explained in the following paragraph.

Two sectors on one of the library's disk drives are allocated to the logging function as locations for temporary storage of transaction records. When the first of these sectors becomes filled with records the monitoring program automatically begins writing new records to the second one. Operating procedure calls for the data center operator to periodically

(every two to three days) check for the condition of a full sector and, if its is full, to transfer the data to tape. Once the second sector is full, then, the program automatically alternates back to the first sector for continuing to record, the operator copies the contents of the second sector to tape, and so on. What occured on about April 18 was that the operator failed to notice that one of the sectors was filled to capacity and required copying. Before the copying was done, the second sector also was filled and the program began writing records into the first sector again, wiping out those records which needed transferring to tape. The high level of terminal activity, caused at least in part by the experiment itself generating several thousand transactions, contributed to the unusually rapid rate at which the disk sectors filled up, but unfortunately this situation was anticipated by neither the data center staff nor the researchers.

With a significant portion of transaction data lost and unrecoverable within the limitations of the research projects' budget and timetable, the decision was made to proceed with the analysis of all the test instrument data and of the transaction data for the two test groups which were retained. The processing and analysis of the transaction log data is detailed here in hopes that the methods developed may contribute to future research efforts in this area. The remainder of this section describes how the transaction data were handled subsequent to their collection.

Because the written test instrument requested that each subject record the terminal to which he or she was working during both tests one and two, the researchers were able not only to distinguish one terminal user from another, but also to associate information gleaned from the written instrument with information on the transaction logs. This was accomplished by visual inspection of a listing of the transaction log which was sorted by terminal, time, and action identifier, and breaking the listing down not only between test sessions for each user but even between parts of the test (the "practice searchers" and the so-labelled search problems). This was a tedious and somewhat difficult process, accomplished by a visual matching of the search arguments recorded on the log with the search problems as they appeared on the test instruments. Reference to the actual test instrument rather then simply dividing up the logs based on the clock time in which each part of the tests was administered was necessary because it was noted that in several instances subjects did not follow instructions; rather than proceeding sequentially through the "practice" search problems and stopping terminal activity at the end of the practice section, a number of subjects skipped ahead to what they apparently perceived as the "real" questions. Such behavior can reasonably be attributable to the effect of the instrument itself, in which the appearance of blanks to be filled in provides subjects some degree of additional motivation or incentive to respond over the

accomplishment of some excercise which appears to have no intrinsic reward nor apparent visibility to the researchers. Following this careful visual inspection of the transaction log printout, the user number and test part code were then appended to each transaction log record.

An additional benefit of referring to the test instrument as each log record containing a search argument was examined was the ability to count each search record (defined as a transaction record containing a search command followed by a search argument) as correct or incorrect. Search records which had arguments bearing no perceptible relationship to any item on either test instrument were tagged as aberrant and thus excluded from counts of incorrect and correct searches.

The subsequent processing of the transaction records was done on a computer. Programs were written to provide counts of command usage for each participant in groups two and three of the experiment, and these counts were appended to the SPSS file containing the data gathered via the written test instrument. This procedure enabled the construction of a number of tables designed to explore possible relationships between written responses and actual online catalog use as recorded by the log. In addition, as a simple experiment, the transaction records were sorted alphabetically by the content of the text field in order to allow for simple visual inspection of the variability with which a particular search argument can be entered by users. The

results of these approaches to analysis are given in the next chapter.

Recruitment of Test Subjects

Developing the two tests and their means of administration using response data collected both on the instruments and on the library's transaction log were but two aspects of implementing the experimental design. Making decisions on an appropriate test population and on test administration considerations required considerable discussion and planning among librarians in the field, two library science research consultants, and systems staff within Northwestern University Library. Three important factors were taken into consideration in the choice of an appropriate test population. Because the size of the test population would have to be limited to the resources available for administering the instruction and the tests, it was important to have a subject group which was relatively homogeneous. As a second factor, to produce results which would be useful to the library community at large, the subject group was also to be in some sense representative of the academic population which would likely be targeted for online catalog instruction, whether they were or not currently library users. Thirdly, it was acknowledged that a fully representative population selected among subjects from a single highly selective private university would be extremely difficult to enlist and thus compromises would have to be made.

Sample Selection

A number of criteria were developed for selecting participants in this project. These criteria were based on variables that were considered likely to have significant effects on the results of the study--age, sex, experience with computer programming and/or computer-assisted instruction, and major field of study. Another goal of the project was to ensure that the results of the analysis could be applied in comparable university settings. With this purpose in mind, a National Council on Educational Statistics national survey of freshmen was used as a guideline for determining sample size and demographic composition.

It was decided to confine the population studied to one "class" or age range of students at Northwestern. For this reason, freshmen between the ages of sixteen and twenty were chosen for participation in this study. The freshman class was targeted for this project because it was believed that students who had been on campus only two to three quarters would have had less opportunity to use the online catalog or to attend an online catalog workshop than more advanced students. A class listing of all 1983-84 freshmen between the ages of sixteen and twenty was obtained from the University Administrative Offices. The freshman class for 1983-84 comprised 1983 students--1029 men and 954 women.

Using this list, a systematic random sample of ten percent

of that population was contacted by telephone. Each student contacted was screened using a short questionnaire, which is included as Appendix Six of this report. If the student had previously participated in an online catalog or a freshman library instruction session, that person was not included in the sample, since s/he would have had previous formal training in online catalog use. If a student had not participated in a workshop, s/he was asked to participate in the research project.

Each student contacted was given a brief description of the experiment. In the telephone interview, students were informed only that the test involved the online catalog at Northwestern University, and that no prior or special experience was needed to participate. The telephone survey was conducted by specially trained students. Originally, interviewers were instructed to advise students that there were no harmful side effects of the study, and that any information they provided would remain confidential. After five to ten phone conversations using this approach, interviewers remarked that students were a bit disconcerted (rather than reassured) about the nature of the study after they were informed of such safeguards. Although it seemed appropriate to mention these precautions at the outset in the telephone interview, the researchers decided to eliminate this explanation from the telephone interview, and review these points with students during the testing procedure.

Token Rewards

At the time of the initial telephone interview, a participation incentive of a free movie ticket was offered to students. The decision to offer a token reward was based on research by Lubans that supports use of incentives to attract a diverse group of participants in library research projects. {7} Lubans notes that the response rates examined for tests of student knowledge of bibliographic tools were biased toward frequent library users. He found that by approaching students outside the library setting and offering them a token reward for completing a survey form, a picture of student knowledge of library resources was obtained that was representative of the population of students. In this light, Lubans explains that previous library user study results were only useful in making statements about active users, because they represented only a segment of the total client population, the frequent library users.

In this initial effort, attempts were made to contact approximately 600 students by telephone. At least four attempts were make to contact each student. Telephoning was scheduled for various times of the day to increase the opportunities for contacting students. Of the individuals contacted there were twenty-six students (fifteen women and eleven men) who had already participated in an online catalog workshop or had a freshman seminar, and so were ineligible. An additional 105 (fifty-nine women and forty-six men) declined participation for

various reasons, most related to anticipative schedule conflicts (e.g., classes, work, extra-curricular activities) or general disinterest in devoting the nearly two-hour time period required to take the treatment. The number of students who could not be reached because they were either not in or had moved with no forwarding address totaled 176. The number of women and men who agreed to participate in the experiment numbered ninety-seven and ninety-one, respectively, for a total of one hundred eighty-eight participants.

Reminders were sent in the form of postcards to these 188 students one week before the testing occurred, with the date and time of the individual's session noted. During this same week student assistants working in the library attempted to contact each participant by telephone to confirm the time and date assigned for testing. Although the researchers made an intensive telephoning effort to secure participants for the project, it must be noted that many students at Northwestern University felt they could not spare two hours for such a project. When given two to three weeks advance notice, many students were reluctant to participate because they had little idea what other activities might be occurring during the testing time that would have higher priority. The added incentive of a free movie ticket did not seem to affect this attitude.

One of the objectives of this project, as mentioned above, was to structure an experiment, based on a generalizable learning

model, the results of which would be applicable in a wide range of university settings. With this end in mind, the researchers examined national norms of demographic, attitudinal, and goal characteristics for incoming college freshmen. Sources used for this information were annual reports of the American Council on Education's Cooperative Institutional Research Program. Each year national normative data are compiled on characteristics of students entering college for the first time as freshmen on a full-time basis. In 1982, this longitudinal study was based on a statistically-adjusted sample of 267,185 freshmen enrolled in 492 two and four-year colleges and universities. As participants in this annual survey, Northwestern University receives these results and compiles their own freshman profile with national norms comparative data. Both of these studies were helpful in determining how many students with the above-mentioned key characteristics for the study ought to be included in the testing process, in order to have a representative sample.

Test Administration

Because the administration of the tests required the availability of a terminal for each subject, special arrangements for physical set-up of the experiment were necessary. An auditorium-style room in Northwestern University Library was set aside for the duration of the experiment, with sixteen terminals of the same type as used throughout public areas of the library temporarily installed around the perimeter of the room. A copy

of the two-volume Library of Congress Subject Headings was placed at each terminal station, on a table providing sufficient workspace for subjects to both complete the written portions of the test and make use of LCSH as necessary. The limitation of 16 terminals was a computer hardware one, as only one coaxial cable leading from a 3274 controller to the available room was installed. This factor limited the number of subjects which could be tested within a given time period. The time required for subjects to receive two types of instruction and take two tests, in which each subject had to have access to a terminal, was initially estimated at between one and two hours, and the administration of two sessions (up to four hours) was deemed the maximum that could be accomodated in a day. These issues in combination led to the subject population size being targeted at 96. The tests were to be administered twice a day for three days, each day set aside for a different protocol. The administration of the test protocol to 87 subjects in six sessions over a three day period required careful allocation of time in order to keep the experimental conditions as much alike as possible in all the sessions. To accomplish this, the tests were administered in advance of the actual experiment to two classes of students to determine appropriate timing for the experiment. With the tests divided into sections based on the format of responses sought, the following times for administration were arrived at and used throughout the experiment:

Time Periods Allocated to Treatments

Live lecture/demonstration	35 Minutes
Reading Brochure	8 Minutes
Placebo (Film)	12 Minutes

Time Periods Allocated to Completing Portions of Test

	Test One	Test Two
Demographic Questions	5 Minutes	--
Part 1	15 Minutes	15 Minutes
"Practice" Search Time	8 Minutes	5 Minutes
Part 2	15 Minutes	15 Minutes
Attitudinal Questions	5 Minutes	5 Minutes

The data gathering for the experiment took place from April 11 to 13, in the third week of Northwestern's Spring Quarter. Two sessions were scheduled for each day at times not likely to conflict with students' class schedules, one at two o'clock, the second at four. In order to insure uniformity of treatment of the two test groups, the "LUIS Workshop" instructional treatment was given by the same instructor for each of the four sessions required for the students in groups Two and Three. The sessions were also monitored by a research assistant who used a checklist to verify that the same points had been covered in each session.

A validity of measurement issue significant for the study design was the comparability of results of the first test with those of the second. Though the items developed for the second

test were intended to closely parallel items in the first, there was no guarantee that they actually measured the same underlying instructional result. To provide some means of verification that the two tests were measuring the same thing, selected items from each test were administered to twenty ramdomly-selected Northwestern undergraduates. Results were tabulated and a chi-square test was used to determine whether scores on items from Test One closely matched scores on items from Test Two. With a p value of .03, the test indicated that item scores from the two instruments closely match, and thus results from Test One and Test Two can reasonably be compared for purposes of determining cumulative learning.

The administration of the actual experiment was nonproblematical overall. Subjects were cooperative, there was a surprisingly low (virtually negligible) dropout rate for a pair of tests that spanned nearly two hours in the mid to late afternoon, and the only difficulty unforeseen at the time was that the standard instruction for resetting the online catalog terminals when they "locked" (preventing any further input) had not been attached to each terminal. Direct observation of the test-taking as it progressed was not revealing, except that it was observed that there was no use of the Library of Congress Subject Headings by any subjects in Group One who received no instructional treatment, nor any by subjects in Group Three following the reading of the instructional brochure only. While

it was not expected that the LCSH would be used by many in the non-treatment group, at least some use was, as the use of the tool was explained on the introductory tutorial screens of the online catalog itself. It is possible that the subjects' perception of the time-boundedness of the experiment led them to pursue a strategy which was goal-oriented to completing all items in the test rather than learning the functioning of the catalog as they went along.

NOTES

{1} Evan Farber, "Catalog dependency", Library Journal, 109:325-28 February 15, 1984.

{2} David Penniman and Wayne Dominick. "Monitoring and evaluation of on-line information system usage." Information Processing and Management 16(1980): 17-35.

{3} John E. Tolle, "Current utilization of online catalogs: Transaction log analysis." Final report to the Council on Library Resources, v.1. Dublin, OH: OCLC. Research Report OCOC/OPR/RR-83/2. Ray R. Larson. "Users look at online catalogs: Results of a national survey of users and non-users of online public access catalogs. Part 2: Interacting with online catalogs." Final report to the Council on Library Resources. University of California Division of Library Automation and Library Research and Analysis Group, April 5, 1983.

{4} Joseph Matthews, Gary Lawrence, Douglas Ferguson, eds. Using Online Catalogs, A Nationwide Survey: A Report of a Study Sponsored by the Council on Library Resources. NY: Neal-Schuman, 1983.

{5} Charles E. Lindblom and David K. Cohen. Usable Knowledge: Social Science and Social Problem Solving. New Haven: Yale University Prwess, 1979.

{6} Jean Dickson. "An Analysis of User Errors in Searching an Online Catalog." Cataloging and Classification Quarterly Spring 1984, 19-38; Arlene Taylor, "Authority Files in Online Catalogs: an Investigation of Their Value", Cataloging and Classification Quarterly Spring 1984, 1-17.

{7} John Lubans, Jr. "Report to the CLR on a Fellowship Awarded for 1971/72" (unpublished) November 28, 1972

CHAPTER FOUR: Findings

Following the completion of the data gathering, the 178 filled-out tests were first paired by student ID and subsequently coded for machine processing. Eighty seven usable pairs of tests were so coded and input for processing using the Statistical Package for the Social Sciences (SPSS). At this stage, the SPSS system file that was created included only that data which was transferred from the pencil-and-paper tests, not the transaction log data. How this monitoring data was processed will be described later in this chapter.

This section of the report will describe the results of the data analysis which describe the subject population and its performance on the two tests. Because the issue of cumulative learning is but one concern in looking at the data, much of the tabular data presented here reflects results of the first test only. This means of presentation, in which a "no treatment" group is compared with a "workshop" group (Group Two) and a "brochure" group (Group Three), makes a first examination of the data clearer for the reader.

Method of Scoring

Two methods were used for reducing the raw responses to individual questions on the tests into a form which would allow realistic comparisons of overall performance on the tests by an individual subject. In the initial encoding of test responses, each response was encoded into a specific category, rather than

being scored as "correct" or "incorrect". Later, the SPSS "record" facility was utilized to assign a "correct" or "incorrect" value to each specific category on each question. From these recorded individual test responses, sums of correct and incorrect responses to an entire test could be calculated for each subject, and a cumulated score for either test could be expressed as total correct, or converted into a percentage correct of all questions for ease of interpretation. A second method used did not treat all item responses together, but grouped the item responses according to their content association with the five learning objectives. This gave each subject not two overall scores (one for each test), but ten -- two scores of success on each of the five objectives.

Results of the Analysis

Table 4-1 below shows the frequency of each test score for all who took Test One. The score is expressed as a percentage of all questions correct. The distribution of scores shows two areas around which scores are clustered, a small cluster around 50 and a larger cluster at about 70. The average (mean) score on this test for all three groups was 64.6% correct. Table 4-2 on the following page gives the distribution of scores for the second test, again combining results from all three groups. On the second test the average (mean) score was 70.3% correct, indicating higher scores overall on the test, though the range of scores was wider and no individual scored above 90% on this follow-up test.

Table 4-1

Test 1 Scores

Test Score	Frequency	%
38	2	2.1
40	2	2.1
42	1	1.1
44	2	2.1
47	7	7.4
49	2	2.1
51	6	6.3
53	6	6.3
56	5	5.3
58	3	3.2
60	3	3.2
62	4	4.2
64	4	4.2
67	7	7.4
69	4	4.2
71	8	8.4
73	3	3.2
76	7	7.4
78	5	5.3
80	2	2.1
82	1	1.1
84	3	3.2
87	3	3.2
89	1	1.1
91	2	2.1
93	2	2.1
TOTAL	95	100.0

Mean 64.608
Median 65.714

Table 4-2

Test 2 Scores

Test Score	Frequency	%
20	1	1.1
40	1	1.1
42	1	1.1
47	1	1.1
51	1	1.1
53	1	1.1
56	5	5.7
58	4	4.6
60	3	3.4
62	3	3.4
64	8	9.2
67	8	9.2
69	4	4.6
71	1	1.1
73	6	6.9
76	6	6.9
78	9	10.3
80	5	5.7
82	9	10.3
84	5	5.7
87	4	4.6
89	1	1.1
TOTAL	95	100.0

Mean 70.294
Median 72.778

Because use studies have observed a preponderance of males using online catalogs, an examination of test score by sex was done for Test One, shown in Table 4-3 below. In this table, as in several tables which follow, the scores are grouped into "Level One" (for scores 90% and above), "Level Two" (for scores ranging from 70 up to 90), and "Level Three" (for scores below 70% correct). Using this grouping, it may be noted in the table that males appeared to score higher than females. However, a chi-square test reveals a value of 4.02, with a high probability ($p=.40$) that this distribution of scores by sex is due to chance. Thus we cannot with any certainty predict that males would score higher on Test One.

Other demographic factors in overall test performance on Test One are also of interest. Table 4-4 below illustrates the relationship between test score (again grouped by performance level) and subjects' previous exposure to computer-assisted instruction (CAI). While it appears that past experience with CAI may improve a student's chances somewhat for performing well on the test, again this relationship is not statistically significant ($p=.35$), using a chi-square test which produces a value of 4.397.

A more complex computer-related task, writing a computer program, does appear to have a relationship to test performance in learning to use the online catalog, as illustrated in Table 4-5. This table shows that students who have written a computer

Table 4-3

Sex by Test Level

	Level One	Level Two	Level Three	Row Total
MALE	3 (75.0%)	17 (53.1%)	19 (37.3%)	39 (44.8%)
FEMALE	1 (25.0%)	15 (64.1%)	31 (60.8%)	47 (54.0%)
COLUMN TOTAL	4 (4.6%)	32 (36.8%)	51 (58.6)	86

* Indicates column percentage
Chi Square = 4.12, p= .40
Number of Missing Observations = 1

*Level One indicates an average test score of 90% or above;
Level Two indicates an average test score of 70% - 90%;
Level Three indicates an average test score below 70%.

Table 4-4

Exposed to Computer Assisted Instruction
by Test Level

	Level One	Level Two	Level Three	Row Total
OFTEN	0 0	2 (6.3%)	2 (4.1%)	4 (4.7%)
SOMETIMES	3 (75.0%)	14 (43.8%)	15 (30.6%)	32 (37.%)
NEVER	1 (25.0%)	16 (50.0%)	32 (65.3%)	49 (57.6%)
COLUMN TOTAL	4 (4.7%)	32 (37.6%)	49 (57.6%)	85

* Indicates column percentage
Chi squre = 4.39689, p = .35
Number of Missing Observations: 2

*Level One indicates an average test score of 90% or above;
Level Two indicates an average test score of 70% - 90%;
Level Three indicates an average test score below 70%.

Table 4-5

Written a Computer Program
by Test Level

	Level One	Level Two	Level Three	Row Total
OFTEN	1 (25.0%)	7 (21.9%)	3 (6.1%	11 (12.9%)
SOMETIMES	2 (50.0%)	13 (40.6%)	12 (24.5%)	27 (31.8%)
NEVER	1 (25.0%)	12 (37.5%)	34 (69.4%)	47 (55.3%)
COLUMN TOTAL	4 (4.7%)	32 (37.6%)	49 (57.6%)	87

* Indicates column percentage
Chi square = 10.46602, p = .03

*Level One indicates an average test score of 90% or above;
Level Two indicates an average test score of 70% - 90%;
Level Three indicates an average test score below 70%.

program in the past are more likely to score well on Test One. With a chi-square value of 10.466, the difference in performance level among students with varying levels of programming experience is statistically significant at the .05 level (p=.03).

Another relationship which was of general interest when considering the demographic characteristics from the first section of Test One was the possible relationship between past online catalog experience and test performance. Table 4-6 below provides data which show the relationship to exist and to be statistically significant at the .05 level (chi-square value=15.021, p=.0047). Clearly, greater past experience with using an online catalog may significantly increase a student's ability to score well on a test related to that catalog's use. This finding is perhaps not surprising, but encouraging, in that the catalog does in fact "teach itself".

The findings reported here relating demographic characteristics to test performance among all three groups are meant to be preliminary. Further analysis which treats demographic factors within the three groups as intervening variables is planned.

An indicator of overall test performance for each of the three test groups is average (mean) test score, again expressed as a percentage of questions answered correctly. Table 4-7 below provides a clear picture of group performance by showing the score for each group on both Test One and Test Two. On both

Table 4-6

Use of an Online Catalog
by Test Level

	Level One	Level Two	Level Three	Row Total
OFTEN	2 (50.0%)	8 (25.0%)	3 (6.1%)	13
SOMETIMES	2 (50.0%)	21 (65.6%)	28 (57.1%)	51
NEVER	0 0	3 (9.4%)	18 (36.7%)	21
COLUMN TOTAL	4 (4.7%)	32 (37.6%)	49 (57.6%)	85

* Indicates column percentage
Chi square = 15.02065, p = .0047
Number of Missing Observations: 2

*Level One indicates an average test score of 90% or above;
Level Two indicates an average test score of 70% - 90%;
Level Three indicates an average test score below 70%.

Table 4-7

AVERAGE TEST SCORE BY GROUP

	Test 1	Test 2
Group 1	54.66	53.21
Group 2	77.5	63.3
Group 3	61.66	76.94

ANOVA Significance < .001

tests the performance of Group One, the control group, was the lowest. Group Two, which received the lecture instruction prior to Test One, performed best on Test One overall, and their score on Test Two surprisingly dropped. Group Three, which read the brochure prior to Test One, performed less well on the first test, but following their receiving the live instruction, performed nearly as well on Test Two as Group Two had on Test One. Analysis of variance tests with the Test One and Test Two data for the mean score by group revealed that the within-group variation on both scores was less than the variation between groups, indicating that the different means for each group are statistically significant ($p < .001$).

These average scores represent overall test performance in only a general way, and are presented in this manner as a way to look at the cumulative learning issue which was of interest in the study. Because of the length of the instruction period and the opportunity subjects were given to interact with the instructor, the superior performance of Group Two on Test One was expected. Why Group Two's performance dropped on the second test, following their exposure to the brochure, cannot be adequately explained by the analysis here, but we may hypothesize that test fatigue may have been an important factor. Recalling that Group Two's taking of the second test was nearly 90 minutes into the period set aside for the experiment, and that the intervening period between tests for this group was much shorter

than for Group Three, it seems highly likely that Group Two was simply tired of responding to questions on the second test. Group Three, while spending as long on the experiment overall as the second group, did have a considerably longer intervening period between the two tests.

Because the model for instruction developed as part of this study was based on learning objectives, it was of interest to examine test performance in a way which revealed how well objectives were achieved by group. To accomplish this analysis, each question was categorized according to which objective it was intended to measure. The content of questions related to more than a single objective in some cases, so that more than one objective category was used for these. The chart on the following page indicates the association of each test question with the objectives on which the instructional program was based. This association enabled for purposes of analysis the construction of two series of five sub-tests, each sub-test providing an indication of the three groups' performance on each objective for Test One and Test Two.

Tables 4-8 through 4-12 on the following five pages report the results of this analysis by program objective, one table for each objective. An examination of the tables reveals program objectives three and five to be most easily met, as shown by results from Test One for all three groups. Nearly 80% of the subjects from all three groups scored at "Level One" for

Table 4-8

Test Level by Program Objective One:
The User Understands What the Online
System Represents

	TEST 1				TEST 2			
	Level One*	Level Two	Level Three	Row Total	Level One*	Level Two	Level Three	Row Total
Group 1	1 (3.8%)	3 (11.5%)	22 (84.6%)	26	1 (3.8%)	2 (7.7%)	23 (88.5%)	26
Group 2	7 (24.1%)	16 (55.2%)	6 (20.7%)	29	10 (34.5%)	15 (51.7%)	4 (13.8%)	29
Group 3	0 (0.0%))	14 (43.8%)	18 (56.3%)	32	7 (21.9%)	20 (62.5%)	5 (15.6%)	32
Column Total	8 (9.2%)	33 (37.9%)	46 (52.9%)	87	18 (20.7%)	37 (42.5%)	36 (36.8%)	87

*Level One indicates an average test score of 90% or above; Level Two indicates an average test score of 70% - 90%; Level Three indicates an average test score below 70%.

Table 4-9

Test Level by Program Objective Two:
The User Understands Selected Concepts of
an Online Information Retrieval System

	TEST 1				TEST 2			
	Level One*	Level Two	Level Three	Row Total	Level One*	Level Two	Level Three	Row Total
Group 1	0 (0.0%)	12 (46.2%)	14 (53.8%)	26	3 (11.5%)	15 (57.7%)	8 (30.8%)	26
Group 2	10 (34.5%)	18 (62.1%)	1 (3.4%)	29	19 (65.5%)	9 (31.0%)	1 (3.4%)	29
Group 3	6 (18.8%)	19 (59.4%)	7 (21.9%)	32	16 (50.0%)	14 (43.8%)	2 (6.3%)	32
Column Total	16 (18.4%)	49 (56.3%)	22 (25.3%)	87	16 (50.0%)	14 (43.8%)	2 (6.3%)	32

*Level One indicates an average test score of 90% or above; Level Two indicates an average test score of 70% - 90%; Level Three indicates an average test score below 70%.

Table 4-10

Test Level by Program Objective Three:
The User Can Operate the Equipment
Accompanying the Online Catalog

	TEST 1				TEST 2			
	Level One*	Level Two	Level Three	Row Total	Level One*	Level Two	Level Three	Row Total
Group 1	23 (88.5%)	0 (0.0%)	3 (11.5%)	26	26 (100.%)	0 (0.0%)	0 (0.0%)	29
Group 2	25 (86.2%)	0 (0.0%)	4 (13.8%)	29	27 (93.1%)	0 (0.0%)	2 (6.9%)	29
Group 3	21 (65.6%)	0 (0.0%)	11 (34.4%)	32	31 (96.9%)	0 (0.0%)	1 (3.1%)	32
Colum Total	69 (79.3%)	0 (0.0%)	18 (20.7%)	87	84 (96.6%)	0 (0.0%)	3 (3.4%)	87

*Level One indicates an average test score of 90% or above; Level Two indicates an average test score of 70% - 90%; Level Three indicates an average test score below 70%.

Table 4-11

Test Level by Program Objective Four:
The User is Able to Structure an Online
Catalog Search by Correctly Choosing, Entering
and Manipulating Appropriate Search Commands

	TEST 1				TEST 2			
	Level One*	Level Two	Level Three	Row Total	Level One*	Level Two	Level Three	Row Total
Group 1	0 (0.0%)	2 (7.7%)	24 (92.3%)	26	0 (0.0%)	0 (0.0%)	26 (100.%)	26
Group 2	4 (13.8%)	7 (24.1%)	18 (62.1%)	29	0 (0)	5 (17.2%)	24 (82.8%)	29
Group 3	0 (0.0%)	3 (9.4%)	29 (90.6%)	32	1 (3.1%)	5 (15.6%)	26 (81.3%)	32
Column Total	4 (4.6%)	12 (13.8%)	71 (81.6%)	87	1 (1.1%)	10 (11.5%)	76 (87.4%)	87

*Level One indicates an average test score of 90% or above; Level Two indicates an average test score of 70% - 90%; Level Three indicates an average test score below 70%.

Table 4-12

Test Level by Program Objective Five:
The User Can Correctly Interpret
the Results of a Search

	TEST 1				TEST 2			
	Level One*	Level Two	Level Three	Row Total	Level One*	Level Two	Level Three	Row Total
Group 1	11 (42.3%)	13 (50.0%)	2 (7.7%)	26	16 (61.5%)	10 (38.5%)	0 (0.0%)	26
Group 2	26 (89.7%)	3 (10.3%)	0 (0.0%)	29	20 (69.0%)	5 (17.2%)	4 (13.8%)	29
Group 3	20 (62.5)	12 (37.5%)	0 (0.0%)	32	28 (98.5%)	3 (9.4%)	1 (3.1%)	31
Column Total	57 (65.5%)	28 (32.2%)	2 (2.3%)	87	64 (73.6%)	18 (20.7%)	5 (5.7%)	87

*Level One indicates an average test score of 90% or above; Level Two indicates an average test score of 70% - 90%; Level Three indicates an average test score below 70%.

objective three, and 65% scored that high on objective five. In contrast, objective four showed the lowest level of achievement, with less than 5% of the subjects scoring high, all of this small group in the group receiving the lecture prior to taking Test One.

Considering the achievement of cumulative learning through examination of these tables, we note that Group Two's performance on Test Two improved significantly over its performance on Test One only for program objective two, and the group actually declined in its performance for program objectives four and five. Group Three, on the other hand, improved significantly on its performance in all program objectives except for objective four. Group One's performance showed a marked improvement in meeting program objective five, and some improvement in meeting objectives two and three. On objectives one and four Group One showed a declined performance on the second test.

What do these findings allow us to say about the cumulative effect of two learning experiences with online catalog instruction? Because there is no clear pattern in improvement on all the objectives for any of the three groups, it is difficult to say. The order of presentation of the two learning experiences -- the brochure and the lecture -- did not appear to affect group performance on all five learning objectives in the same way; for some objectives a score increase between Test One and Test Two might have been the result of the lecture having

been given first, for other objectives it might have been the brochure being presented first. Because the analysis presented here does not make use of statistical tests of significance, further work is in order to refine the analysis and sort out what factors may lead to improved test scores.

The work of analysis with the transaction log data turned out to be much more cumbersome than expected, due in some measure to the sheer quantitiy of data to be processed, and in part to the amount of time involved in just becoming acquainted with processes of analysis for this type of problem. As noted in the previous chapter, the loss of transaction log data from Group One limited the generalizability of any findings which could be based on the logs. While continuing work on making the presentation of this data more tractable is proceeding, this report presents simply two types of exploratory analysis which have so far been completed.

One question of an exploratory nature which could be applied to log analysis is: How might search behavior be affected by the type of training users received? More specifically, we could ask: With what frequency are features of a system used among two groups of users who have received different training in the system? Table 4-13 presents information pertinent to that question, showing simple frequencies of the use of system commands and of two error messages. The errors "J" and "K", incidentally, are the only errors which are actually encoded on

Table 4-13

Frequency of Command by Group and By Test

	Test 1		Test 2	
FREQUENCY OF COMMAND	Group 2	Group 3	Group 2	Group 3
"ENTER"	1272	1558	826	1128
AUTHOR SEARCH	282	294	160	248
TITLE SEARCH	474	493	298	374
SUBJECT SEARCH	308	460	254	320
HELP REQUEST	28	68	12	14
ERROR J	158	140	86	104
ERROR K	16	14	10	22

the transaction logs themselves, the "J" error being the result of an unrecognizable command being sent to the system, the "K" error produced when an invalid line number is requested.

The frequency of use of system commands alone cannot tell us whether the commands are used appropriately or whether the search arguments with which the commands are associated are formatted correctly. We can, however, make some observations about the data presented in Table 4-13. We first point out the noticeable drop in the overall activity (as indicated by the frequency with which the "enter" key is pressed) of Group Two between tests one and two. This seems to confirm the "test fatigue" experienced by this group, discussed earlier in this chapter. A second observation is the marked difference between Groups Two and Three on the number of subject searches performed within Test One. This is the result of the greater exposure Group Two had to the notion of controlled vocabulary and the Library of Congress Subject Headings, leading to less random guessing in the construction of subject searches. A third notable comparison is the marked difference between Groups Two and Three in the number of times help screens are called on the first test. Group Three has made greater use of the online help facility, likely because the reading of the brochure offered less detailed information than the lecture, and the brochure specifically referred to the help facility as a means to gain further information about the system.

25
28
22
32
20
100 mm
1.0
1.1
1.25
1.4
1.6
2.8
2.5
2.2
2.0
1.8
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
1.0 mm
1.5 mm
2.0 mm
A5
PG

Another approach we took in analysis of the transaction log data was to order the transactions from each of the two groups alphabetically by the data input portion of each log record. As with our frequency data on the logs, this means of analysis is also exploratory and far from complete. Table 4-14 below shows a count of common input errors which was rather easily derived from this ordering of the log data. While not much can be said of this particular table, as the count of errors by group fails to differentiate between errors made in Test One from those made in Test Two, elaboration of the procedure tried here may well lead to more interesting results.

Other manipulations of the transaction data have been performed, though the results are not yet in a state adequate for presentation. Further work on the log data is planned, especially work which goes further with the tying of user test performance with actual transactions than we were able to accomplish within the time period of the grant.

Table 4-14

ERROR PATTERNS BY GROUP

Type of Error	Group 2	Group 3
Forename First in Author Search	7	12
Initial Article in Title Search	8	35
Search Argument Without Search Command	5	8

CHAPTER FIVE: Conclusions

What have we learned out of this project? Through a close examination of the process of developing learning objectives, creating a program to help meet them, and evaluating the outcome of the program, there are a number of conclusions which we can make. This chapter details not only those conclusions, but suggests further research on a number of specific points which arose in the process of this research but fell beyond the scope of this study.

This research has provided some answers to the question which initially motivated the study, "Why teach use of an online catalog?". First of all, we have presented evidence that teaching improves user performance on a written test, and, albeit with limited data and thus more tentatively, on a test involving the online catalog itself. Through the process of developing learning objectives, we have further helped define for the field at large those specific competencies which lead to better performance.

In the matter of evaluating the achievement of the specific learning objectives, we were less successsful. Although we established a means to analyze the result of the evaluative test in a way that treated the achievement of each objective seperately, we must acknowledge that a conceptual dilemma exists. As certain objectives deal more concretely with the learning of definitions and concepts which are easily tested for while other

objectives, concerned as they are with the execution of procedures, are inherently more difficult to test for, we cannot make clear conclusions regarding different levels of attainment on the test. Different attainment levels may reflect more about the tests themselves than about actual superior performance in online catalog searching. With the use of open-ended questions which seek a rationale behind a particular procedure, the pitfall exists that the instruction was geared to the test rather than the actual learning which the test was designed to measure.

Another aspect of our response to the "Why teach the online catalog" question must be that, indeed, certain problems are inherent with such teaching at this time. Prime among these problems is the necessity to train users on some procedural matters on a piecemeal basis, leading to difficulties in users' assimilating the information. Our overall strategy of creating a set of learning objectives which could be generalized beyond a single online catalog tended to mask this problem from our own awareness, for the problem really arises not in a generalized model of an online catalog but in helping users with system features which are typically idiosyncratic to a single catalog or even a single library. In LUIS, any one of five possible two-letter codes appears at the left margin of each author/title and title/author index entry, designating which of five cataloging units bears responsibility for the bibliographic records corresponding with each index entry line. The codes are

useful for quick determination of the location of bibliographic items for those familiar with the codes, but their meaning is not at all obvious to the casual users though they are briefly deciphered on help screens. Should the use of these codes be taught? Our practice has been not to teach them, to alert people of the general help feature instead, but the question of their meaning and function does occasionally arise from our students. When the question does come up, it generally elicits a response which explans the peculiarities of Northwestern University Library's administrative organization, or, with less accuracy, the code is equated with a physical location for the bibliographic items. Either explanation, while perhaps helpful in and of itself, distracts from the overall flow of the presentation and adds detail which the audience is not likely to retain easily. What is perhaps a greater problem, the explanation reveals idiosyncracy in the system, possibly leading to loss of confidence among users that the system can be mastered, a situation which tends to defeat the overall instructional goal.

Idiosyncratic features in online catalogs abound, at least at present. Though explanations for users through printed guides, lectures, online help, or across-the-desk assistance ease the burden for users, such explanations are hardly teaching. The explanation to a user of one odd feature in one catalog does not prepare him or her for the next feature or the next catalog, and

also tends to devolve the teaching function to the passing down of a collection of discrete and unassimilated (and unassimilable) facts.

The real dilemma created by teaching these system aspects which are not self-evident and not easily integrated with the overall view of the system is that a role conflict is almost inevitable for the librarian. The responsible teacher must also be a critic, pointing out flaws and inconsistencies in any system he or she is teaching, for to avoid doing so is to lose credibility as a teacher. Yet as a spokesperson for the library, the online catalog teacher is, at least at this early stage of online catalog development, put in the position of justifying the library's decision to adopt the system. Mediating the conflict between critic and spokesperson may not be easy, but we might begin by straightfoward recognition that both roles are valid. Beyond that, bibliographic instruction librarians must join forces with others who have more direct responsibility for online catalog operations to attach higher priority to a top-quality user interface development, so that the idiosyncracies can be eliminated. Avoiding teaching those things that are not well-taught should become a goal for public services librarians.

We found the use of transaction logging in instructional evaluation to be a complex and difficult undertaking. The engineering of data collection in a controlled test situation required dedicated terminals, space, considerable set-up time,

and coordination with departments throughout the library and the library's data processing center. With all that preparation, we experienced the loss of about a third of the data we intended to collect, as described in the body of this report. The resources required merely to collect the data, much less undertake post-processing, were substantial, involving the allocation of considerable disk space which for most libraries would be prohibitively expensive. It should be noted that although the transaction logging facility is available as part of the NOTIS software, in place at Washington University and several other libraries, Northwestern Library itself is the only NOTIS installation recording transactions on a regular basis. Other libraries which must compete with non-Library computer users for disk space or a shared mainframe have not been able to undertake transaction logging to any great extent.

Beyond the actual data collection, subsequent data manipulation and the tying of transaction data to data collected on the pencil-and-paper test was considerably more laborious than expected when we began the project. Working from a printout of the transactions sorted by terminal indentifier and time, we were able to parse the records in order to attach series of records with subjcts used in the experiment, but it was entirely a manual process. Additional keying was then required to augment the log records with the respondent identifier, and custom programs had to be written to produce the counts that were subsequently

appended to the SPSS file of test responses. The very provisional results we were able to obtain within the time and resource limitations of the study do not in themselves appear to have warranted the effort.

On the other hand, it must be understood that this use of transaction data is experimental, that to our knowledge the manipulation of transaction data for instructional evaluation has not been attempted before, and that additional software for this purpose, once designed and incorporated into integrated systems, may in the future make the implementation of transaction-based evaluation methods more viable. Our experience suggest two avenues for development in this regard:

1. The extraction and manipulation of log records, if the records are to be used in performance evaluation by individual online catalog users, must be managed by high-level applications software which is accessible at least to instructors themselves, but preferably to users as well, for self-evaluative purposes.
2. It may well be more efficient, given the limited resources most libraries may have to record user data, to provide for two types of transaction logging, one which compiled brief transaction records and reported on overall system use on an ongoing basis and a second which could be invoked on an occasional, on-demand, basis, providing more data which would be helpful in evaluating performance of an individual user or

group. This second type of data collection might be designed so that output could be invoked by a user from the terminal being logged, analogous to a "search history" report available with some online catalogs and commercially-vended online systems.

In sum, with transaction logging we are still data-rich but analysis-poor. The interest expressed by many librarians in this aspect of the research project attests to the value that transaction log analysis may hold for instructional evaluation, though that speaks only in terms of "potential." It is our view that such potential is genuine, and that continued experimentation which relates anticipated results closely to the concerns of librarians working in the field should be pursued. Librarians are in need of information about the use of catalogs, and users of catalogs may benefit from additional feedback on their usage. How transaction log processing software which is more accessible to the workaday librarian and even the user can be integrated into our systems presents a challenge to catalog designers, and, it seems to us, a worthy challenge.

The above discussion of the results of our experiment and transaction log analysis relates specifically to Northwestern's experiences with the project. What can we say more generally about the design of online catalog instruction based on our experience of intensive examination of objectives and evaluation methods over the duration of this project?

Most of all, we have come to see that limitations imposed by the study process itself point to areas of difficulty in the way we, and many others in library public services, conceive of the problem of online catalog user education and thus approach solutions. Our habits and training as librarians have led us to view the online catalog and its use too much in isolation from other information retrieval developments in libraries and beyond libraries. Because the online catalog is at present the most widely accessible information-retrieval tool, because it is still new, because problems of its administration have sparked special interest within the field of librarianship and among agencies such as the Council on Library Resources who have funded this and other research, we have perhaps been looking at the instructional problem too narrowly. Though in this research we developed a model program which demonstrated positive results in subjects' performance on tests of online catalog knowledge, there are clear indications we set our sights too low. Instructional development which embodies objectives for generalized information retrieval may be a more appropriate teaching focus at the college level.

There are two ways in which the focus we imposed on the project seems to have limited the model which was created and used in the experimental part of the project. First of all, by concentrating our focus on online catalog instruction, the consideration of how this teaching was to become integrated with a broader program of user education received less attention than

it should have. As a new and very important tool, the online catalog consumes a great deal of attention among public services staffs, but this concentration of attention should not necessarily lead to building programs around the teaching of one tool alone. Users are on the whole pleased with the online catalog as a tool, but for them it is one tool among many, and more to the point, a means to an end rather than an end in itself.

There is, in this early period of online catalog implementation, a degree of glamour and fascination with a very user-accessible online system, a level of public interest that librarians can take advantage of in building user awareness of a variety of library tools and services. The online catalog can serve as a good "hook" for introducing new information about even the card catalog. But making the online catalog training the goal of an instructional effort may lack the substance to engage students, as such training in an of itself is seen as unnecessary; from a practical vewpoint, for most searches, self-instruction through trial-and-error and use of interface features works. The "LUIS Workshops" developed in conjunction with this project were poorly attended, we feel, because they were preceived to offer no more than online catalog instruction, and they were not tied into any curricula in which students had their primary educational involvement. Online catalog instruction presented as a segment of course-related instruction,

on the other hand, has consistently been a source of both student and faculty interest, and has provided a springboard for many free-ranging discussions about library-related issues such as online searching, collection development, and bibliographic networks. In this light, the online catalog instruction developed in conjunction with this project is usefully conceived of as a module to be incorporated with a larger user education program rather than as a program that can stand independently.

The second way in which our focus may have limited the development of a model was in the natural tendency we had to think of the new tool in terms of the old tool, the card catalog. In seeking a cognitive model upon which to base instruction, we fixed on the card catalog because a number of valuable analogies and comparisons could be made. The issue of inclusivity of the card and online catlogs, the content of individual records, and the access points of the two files are obviously useful discussion points when explaining the online catalog. But as we move further in our own thinking as librarians about the direction in which online systems are developing, the card catalog analogies may become less and less appropriate, or even relevant. The advances in computer communications rapidly approaching (in some respects already in place) make the acquisition of knowledge about information retrieval, broadly conceived, increasingly valuable for any library user. Many libraries provide public OCLC terminals in addition to an online

catalog of local holdings already in place or planned. Online searching of commercially- vended bibliographic files is gradually working its way from behind the reference desk out into the room. We can soon expect, as an outcome of the Linked System Project, to provide the searching of remote files directly within the online catalog interface now provided users. As these systems are introduced, we need to be aware of the more complex training needs they may require as well, and building upon our online catalog training experience may be a useful way to prepare both ourselves and our staffs. But to do this, our conceptualization of what is most usefully conveyed about the online catalog must be generalized beyond our traditional notions of catalog teaching.

A more generalized approach to online catalog teaching would most likely begin with explanations of record structure and file organization as elemental building blocks for an information retrieval system, and then going on to describe the types of indexes to the file which may be available and the commands necessary to access the indexes. The online catalog toward which the teaching would be directed would serve as an example of a particular implementation of general principles, but not the only possible implementation. Bringing in another example, such as a general database management system now commonly available even on a microcomputer, would enrich the instruction. Such a training approach would be more challenging to students, and have the

great advantage of providing information which would be useful in other contexts.

It is likely that many librarians may reject the generalized approach proposed in this report as "too theoretical." We acknowledge that the approach relegates to a secondary status many of the pieces of helpful information that may make a particular online catalog easier to use, but we feel a broader view may gain both better acceptance by students and better transferability to convey a higher level of mastery of these basic principles to students than perhaps was conveyed to themselves in the period of their formal professional training. Overcoming the sense of insecurity that this situation may bring will perhaps be difficult at first for many librarians, but as risks are taken, the rewards may reinforce the new approach suggested here.

Integrating online catalog instruction into a full bibliographic instruction program and making the instruction more generalized go hand in hand toward preparing both librarians and a new generation of information users for the future. This future will see libraries providing more information both electronically and via more traditional media.

APPENDICES

APPENDIX ONE: Learning Objectives for Online Catalog Education

General Objective:

Upon completion of the instructional activity, a user should have an understanding of the function and scope of the online catalog system and be self-sufficient in using computer catalog public terminals to perform non-problematic monograph and serial searches.

PROGRAM OBJECTIVES

P1 The user understands what the online system represents.

P2 The user understands selected concepts of an online information retrieval system.

P3 The user can operate the equipment accompanying the online catalog such as the terminal, keyboard, and printer.

P4 The user is able to structure an online catalog search by correctly choosing, entering, and manipulating appropriate search commands.

P5 The user can correctly interpret the results of a search and can identify information from it that is pertinent to his/her information needs.

Learning Objectives for Online Catalog Education

General Objective: Upon completion of an online catalog instructional activity, a user should have an understanding of the function and scope of the online system and be self-sufficient in using computer catalog public terminals to perform monograph and serial searches.

P=Program Objective E=Enabling Objective

P1 The user can describe what the online system represents.

A. The user understands the function and purpose of the online catalog.

E1 The user can define the phrase "online computer catalog," and understands that he/she interacts directly with the computer's memory and logic when operating the keyboard and terminal of the online catalog.

E2 The user understands that the public terminal, screen, and keyboard are used to transmit a catalog search question on the terminal screen to the computer.

E3 The user can recognize and define basic computer terms such as command, database, online, terminal, and search term.

B. The user can define the scope of the database in terms of the types of materials included and excluded and the dates of coverage.

E1 Given a citation, the user can decide whether to look in the card catalog, the online catalog, or an index to locate the item cited.

E2 The user can identify the different types of information that are available in the online catalog, such as bibliographic (author, title, publisher, date of publication), circulation, library location symbols, cross-reference provision and call numbers.

P2 The user understands selected concepts of an online information retrieval system.

E1 a. The user can distinguish between subject searching and other forms of searching.

E1 b. Given a subject search, the user selects terms from LCSH, MESH, or other controlled vocabularies as appropriate.

E1 c. Given a search other than subject, the user selects uncontrolled terms in appropriate formats for searching.

E2 The user understands the purpose of truncation and the way it is implemented in the specific system. She/He demonstrates understanding of truncation by applying it at appropriate times and in the appropriate form.

E3 Given a list of terms, the user can distinguish between terms which are meaningful as keywords for searching in the online catalog and those which are not meaningful.

P3 The user can demonstrate how the equipment accompanying the online catalog is operated (e.g., terminal, keyboard, printer).

E1 The user is able to use the alpha-numeric, transmitting, and special function keys (enter key, reset key, clear key) on the keyboard correctly.

E2 The user is able to identify commonly-held misconceptions regarding the use of computers and computer terminals, specifically the fear of damaging the system by incorrectly operating the equipment and expecting system correction of inputting errors.

E3 The user is aware of the existence or lack of existence of sign-on procedures required by the online catalog.

P4 The user is able to structure an online catalog search by correctly choosing, entering, and manipulating appropriate search vocabulary.

A. The user can state the existence of the different methods of searching the online catalog.

E1 The user is able to enter each of the commands that retrieve various records from the online catalog correctly. Given an author, title, or subject command, the user is able to choose the appropriate command for his/her information need.

E2 The user is able to combine a search command with an argument.

E3 Given an information need which requires utilizing the subject searching capability of the online catalog, the user will select the appropriate printed source (such as Library of Congress Subject Headings, Sears Subject Headings, Medical Subject Headings), if any, to correctly format the search.

E4 The user avoids common inputting errors and is aware that inputting errors can cause a search to fail.

E5 The user is able to locate a unique bibliographic record, given partial or complete information about the desired item.

E6 Given a choice between initiating an author, title, or subject search, the user will select the most system-efficient search category for his/her information need.

E7 The user can employ special searching features available for the system in the search process such as truncation, key word searching and use of boolean logic.

B. The user is able to utilize system features in order to manipulate retrieved data and fully exploit system capabilities.

E1 The user is able to recognize and identify different categories of display within the system.

E2 The user can explain the function of the key data elements provided in each display in order to complete or continue a search.

P5 The user can correctly interpret the results of a search and can identify information from it that is pertinent to his/her information needs.

E1 Given a bibliographic record display, the user is able to identify author, title, publication date and publisher and call number from the record.

E2 Given a complete citation, the user can locate useful information in the record, such as author birth and death dates and collation.

E3 The user can interpret any online error messages.

E4 Given an error message, the user can return to point at which error was made and proceed correctly.

E5 Given a library location code from a screen of information, the user is able to identify correctly the area of the library in which the material may be found.

E6 The user is aware that online assistance is available for the online catalog in the form of help screens.

E7 The user recognizes the library staff as a source of information about the online catalog and uses when appropriate.

APPENDIX TWO:

Model Program Materials For Educating the Online Catalog User:

Instructional Materials for the Model Program

This appendix to the "Educating the Online Catalog User: A Model for Instruction Development and Evaluation Report," provides a description of the supporting instructional materials developed for the program. These materials are based on the generalizable learning objectives that are detailed in Chapter Two.

The establishment of learning objectives is an essential step in instruction planning, as the objectives specify the expected outcomes of the instruction activity. With these objectives in mind, a workshop approach to teaching the online catalog and a printed guide were devised for the project. The objectives served as the means for determining content of these methods. Consensus in the bibliographic instruction field holds that a multi-faceted instruction program which provides a variety of learning opportunities or teaching methods best meets the needs of a user community - a diverse population with different learning styles. For the purpose of this project these two methods were utilized, though the objectives readily lend themselves to other teaching approaches. At Northwestern, the online catalog user education program included a workshop and instructional brochure. The workshop outline and the brochure were modified for use in this project once learning

objectives had been developed. The following discussion details the content of these teaching methods.

Workshops

The "LUIS Workshops" are structured to provide within a 50-minute session basic instruction in the use of LUIS, Northwestern's online catalog. Each session is conducted by a reference librarian, who uses a chalkboard, printed handouts, and three video monitors attached to a single CRT terminal as teachning aids for the presentation. The terminal is linked by cable to the Library's computer, and also is connected to the monitors which provide the same display as the terminal screen.

The LUIS Workshop sessions are structured in two parts. The first part is a presentation of concepts, relating the online catalog to the card catalog in order to take advantage of what the students may already know about catalogs in general. It is in this first part that an overview of the system in provided and information is presented related to automated retrieval and file structure. The LUIS online system and manual catalogs are compared in order to sensitize students both to the similiarities of the two files and to the search strategies that must be adjusted according to which file is approached. This content provides a means of conveying what may be new information about the online system in a way that does not patronize.

The second part of the session focuses on specific

features of the LUIS system, highlighting especially those features which seem to cause the most difficulty for users. It is during this part of the session that the monitors are used extensively to provide illustration of system strucure along with the major points covered. Throughout the second part of the session, an underlying goal of instruction is to convey the pattern and regularity of the retrieval system and the user interface. Attention is drawn to the location of user prompts and help screens. The constant redisplay of the original search input on every screen is pointed out to give the user a means of self-diagnosis for errors. The basic construction of a search statement is exhibited through the use of a number of specific examples. Attention is specifically directed toward how to manage the size of retrieval through the use of truncation and how to manipulate the system to cope with a large retrieval.

The attached workshop presentation outline is provided to all librarians participating in planning similar programs.

Workshop Presentation Outline

The outline that has been used at Northwestern has been modified and generalized to serve as a convenient instructional framework for other libraries. The suggested presentation outline comprises two main sections: 1) An introductory section, describing the purpose and length of the session; 2) a four-part content section, which is organized around the five

program objectives. This section includes discussion of A) What the computer catalog represents; B) the scope of the computer catalog; C) Constructing and formatting a search statement; D) Demonstration examples.

The objectives that form the basis for the instructional session are broad, and therefore should be prioritized according to the needs of the institution and its system. The outline does not attempt to provide a level of detail that includes coverage of each of the enabling objectives. Careful selection of examples, however, can serve as an effective means of assuring that these enabling objectives are incorporated into the workshop. In the presentation outline, program objectives that correspond to the content of the workshop are listed.

After adapting the outline to fit the specific features of a system, the outline can serve as a means to insure continuity in instruction. While each instructor will be able to personalize his or her approach and style to presenting the workshop content, the basic objectives in the outline will remain consistent across presenters.

Printed Material

The availability of printed instruction saves constant repitition by library staff of the most basic information about the system. It is generally agreed that the availability of a guide accommodates the user who prefers self-instruction

through a printed system overview. A single-sheet printed brochure -- "Using LUIS" -- was designed to serve as a quick-searching supplement to the instructional program. As with the workshop approach, the searching guide incorporates the concepts represented by the five program learning objectives. The brochure includes the following points:

1. Step-by-step instruction and examples for performing author, title, and subject searches in the online catalog which correspond to Program objectives 3, 4, and 5.
2. Helpful information about specific system functions and automated retrieval concepts. For example the following points are made: "Information is sent to the computer only after you press the ENTER key;" "When typing numbers do not substitute the letter "o" for the numeral "0"'; also provided are specific example of truncation. These points all correspond to Program objective 2.
3. An explanation of what the online catalog system represents and what is included in the database is provided. This instruction is related to Program objective 1.
4. A helpful list explaining abbreviations for codes used in the copy holding statement in the bibliographic record indicates various locations of items in the library.

APPENDIX THREE:

Educating the Online Catalog User

General Presentation Outline

Advance preparation for the session will insure that:
1) Equipment is operational
2) A sufficient supply of handouts, worksheets, etc. is available
3) Classroom is organized

I. Introductory Comments (5 minutes)

A. Identify self and position.

B. If session is voluntary attendance, inquire about how participants learned of the workshop.

C. Assess audience familiarity with Library and computer catalog

D. Briefly describe length and purpose of presentation by noting the following points:
-Describe the computer catalog
-Describe relationship between card catalog and the computer catalog
-Outline efficient ways to search the computer catalog
-Discuss the scope of the online catalog (monographic publications, serials publications, etc.

E. Stress the availablility of library staff assistance at all public service desks.

F. Mention the availability of online instructions in the form of introductory screens, help screens, or other prompts.

G. If Dial-Access is availableto the system, briefly describe this, offering to provide further details after the session is over.

II. Presentation Content (15 minutes)

A. Describe What the Online System Represents
Corresponds to Program Objective 1: The user understands what the online system represents.

1. What is the Computer Catalog
Corresponds to Program Objective 1, part A: The user understands the function and purpose of the online catalog.
Give a brief overview of the system. Emphasize the point that the user interacts directly with the computer's memory and logic when operating the keyboard and terminal. Describe the types of searching capabilities available in the system (e.g., author, title, subject, boolean). Also mention other types of information provided by the computer catalog (e.g., circulation, cross-references, location and holdings.)

2. Define the Scope of the Database
Corresponds to Program objective 1, part B; The user can define the scope of the database in terms of the types of materials included and excluded and the dates of coverage.

a. What is in the computer catalog
Discuss what types of materials are listed in the computer catalog (e.g., books, periodical titles, microfilm, items on order) with particular emphasis on the initial dates when online bibliographic records for these items were first input into the

computer catalog. Be sure to include information about materials from special collections, departmental, or affiliated libraries, if these collections are also available through the computer catalog. Again, emphasize dates of coverage. Note specific kinds of information provided by the online catalog -- Note that the phrase "bibliographic record" refers to descriptive information about books and other library materials (e.g., authors name, date, year, and place of publication, authors year of birth, whether the book is illustrated, has bibliographical references, tables, etc., call numbers, location information, circulation status, related subject headings, etc.)

b. What is not in the computer catalog.
To reinforce an understanding of what information is listed in the computer catalog, a synopsis of items not listed in the online file provides a helpful contrast. Mention again the dates when bibliographic records were first imput into the system, emphasizing that library materials processed before that date could only be located in the card catalog. Note any special or departmental collections not included in the computer catalog. If non-roman alphabet titles are not found in the online catalog, be sure to mention this. Another

important point is the fact that journal articles are not listed in the computer catalog. Clarify the distinction between periodical or magazine title and titles of magazine articles.

c. What is in the card catalog.
In this presentation, it is also helpful to incorporate a description of what types of information can be found in the card catalog, note that author, title and subject information about library materials is available in the card catalog. As with the computer catalog, it is important to mention whether cards for items currently processed are still being filed in the card catalog. If cards are not being filed for current materials, emphasize both the date when this practice ceased, and the fact that the student must use the online catalog in order to locate this information. Note the existence of cross-references as standard in the card catalog, and explain their importance in helping a researcher move from an unused heading to one that is used to find information on a particular subject. If cross-references do not exist in the computer catalog, discuss alternative strategies for subject searching here (if subject searching is available on the system). Also, if the shelflist is available for public access, describe how it can be used and note whether it is kept current.

d. What is not in the card catalog .
As with the computer catalog, note materials not available through the card catalog (special, departmental collections, government publications, maps, recordings, software, etc.)

3. Constructing and Formatting a Search

a. Demonstrate how the Equipment is Operated (5 minutes)
Corresponds to program objective 3: The User can operate the equipment accompanying the online catalog such as the terminal, keyboard, and printer. Define the function of special keys used to interact with the computer (e.g., enter, reset, clear keys), locate them and demonstrate how they are used. Stress the pont that there is no chance of damaging the computer catalog by incorrectly operating the equipment. By the same token, remind students that the computer does not think -- it searches for exactly what is input.

b. Demonstrate how to initiate and Format an Online Catalog Search. (20 minutes)
Corresponds to Program Objective 4: The user is able to structure an online catalog search by correctly choosing, entering, and manipulating appropriate search commands.

Begin with a discussion of structure of the computer catalog's introductory and help screens, demonstrating what type of online assistance, if any, is available. Indicate where a search term is displayed on the screen, as a point of reference for the student to use to check his/her search statement throughout a search.

Highlight the availability of any system prompts, noting that if the student is unsure of how to proceed at any time, there is always at least an alternative course of action -- to request online assistance.

Describe the various means available for searching the computer catalog (e.g., author, title, subject, books).

Indicate how a search statement is constructed. (These points are most effectively illustrated by the use of examples which are listed in the following section.)

4. Demonstration Examples

The selection of good examples is an effective means to illustrate system points that may seve as a source of difficulty for users. (It is useful to make up a list of example searches in advance that best illustrate the various searching methods and techniques that can be used with the computer catalog. In addition, the session runs more

smoothly if the instructor has prepared a list of examples which he/she can be confident will effectively illustrate important points.)

If the design of the system is such that different levels of display appear depending on how much information is retrieved, an example is an effective method for clarifying the distinction between these various levels.

For instance, Northwestern's LUIS system has three possible levels of screen display that might appear during search -- guide, index, or bibliographic record. In an author or title search in LUIS, if more that one author or title matches a search request, the screen displays an index which lists titles or author/itlte combinations that match the word or phrase entered. To see the bibliographic record for any listing in this index, the user must type the number that appears to the left of the title. If more than seventeen authors or titles match a search request, the screen will display a guide that groups the index into sections. From this guide the user may select the number of the author or title that would display the section of the index he/she wished to see. From this index, the user could see a bibliographic record by typing the number to the left of the title he/she wished to see.

APPENDIX FOUR: TEST ONE

NORTHWESTERN UNIVERSITY LIBRARY
COMPUTER CATALOG STUDY
QUESTIONNAIRE

TEST ONE

Northwestern University Library is conducting a computer catalog research study. The study is intended to measure the effectiveness of instructional methods based on user performance. It has been funded by the Council on Library Resources, Inc.

April, 1984

Your Student Identification Number

_____

Group Number

_____

ABOUT YOURSELF

INSTRUCTIONS
Please answer the questions below by marking either an "x" or a check-mark in the space provided.

1. I am:
   ____ male
   ____ female

2. My age is:
   ____ 16
   ____ 17
   ____ 18
   ____ 19
   ____ 20
   ____ other (please write in)

3. My average grade in high school was:
   ____ A
   ____ B
   ____ C
   ____ other (please write in)

4. From the list of different undergraduate fields of study below, mark the one category that best describes your major. If you don't have a major area, choose one category nearest to what you think it will be:
   ____ arts and humanities
   ____ biological science
   ____ business
   ____ education
   ____ engineering
   ____ physical science
   ____ pre-med., pre-law, pre-dental
   ____ social science
   ____ journalism
   ____ speech
   ____ other (please write in)

5. For the activities listed below, please note which ones you have done within the past year, and how often you have done them by circling one of the following for each:
O=often; S=sometimes; N=never:

	OFTEN	SOMETIMES	NEVER
written a computer program	O	S	N
taken a computer-assisted course	O	S	N
used an online computer catalog	O	S	N

6. Do you or your parents own a microcomputer?
____ yes ____ no

7. How often do you use a microcomputer?
____ daily
____ two or three times a week
____ once a week
____ two or three times per quarter
____ never

8. How often do you visit Northwestern's library to use materials in the library to complete a class assignment, term paper, or project? (Do not include times you have used the library simply as a place to study)
____ daily
____ two or three times a week
____ once a week
____ two or three times per quarter
____ never

9. Were you aware before today that Northwestern library has a computer catalog you can use to look for books and other library materials?
____ yes, but I **have not** used it
____ yes, and I **have** used it
____ no

10. How many times during the past year have you used Northwestern's computer catalog?
____ never
____ 1-5 times
____ 6-10 times
____ 11-25 times
____ more than 25 times

11. Have you ever used a computer catalog in a library other than at Northwestern?
____ yes
____ no

12. If yes, in what library did you use it?

_____

Your Student Identification Number

_____

Group Number

_____

ABOUT THIS WORKSHEET

You will not be "graded" on your answers to the following questions. So, please don't guess at answers; just mark "I don't know" or leave the question blank. If you discover an answer to an earlier question as you work through this form, please don't go back and correct your first response. We are interested in your first response to the question.

INSTRUCTIONS

In sections A and B on the following 2 pages, please choose the term from the lists that match the definitions given, and write it under the correct definition. If you are unsure about the meaning of the definition, please don't guess. Just leave the space blank.

SECTION A

The definitions in this section refer to general terms associated with computer catalogs.

search statement	computer catalog
dialup	online
database	terminal
cursor	enter
LUIS	command

1. An online file that provides access to books, journals, and other materials available in a library.

   _____

2. The piece of equipment which is used to communicate with a computer, both sending messages to it and receiving responsed back.

   _____

3. A message typed into the computer terminal that directs the computer to perform a specific operation.

   _____

4. The combination of a command (a=, t=, s=) with the author's name, book, or journal title, or subject term you are searching for in the computer catalog.

   _____

5. Interactive or direct communication between the user and the computer, which allows a search request to be processed and the results displayed immediately on the terminal screen.

   _____

6. The name of Northwestern University's computer catalog.

   _____

7. A collection of information in machine-readable form that is accessible by a computer.

   _____

SECTION B

The definitions in this section refer to features used when searching computer catalogs.

bibliographic record	subject heading guide
truncation	datapac
help screen	set
subject heading	boolean lo{ic
author/title index	

1. A technique used where only the first part of a word or phrase is typed into the terminal. The computer then retrieves all matching terms that begin with this phrase or partial word.

_____

2. Information and instructions available on the terminal screen, that explain how to construct a search and use the information from a search.

_____

3. A term used to represent a topic. It is useful when searching for books and other materials on a topic in the card catalog or computer catalog.

_____

4. A complete list of all authors or titles in the database that matches a search statement.

_____

5. When more than one subject term matches a search request, the screen displays this listing of all matching search terms.

_____

6. All the information necessary to identify a particular publication. This includes the author's name, the title of the publication, the publisher, date, number of pages, and where the item can be found in the library.

_____

INSTRUCTIONS

In this next section, please circle the letter for the correct answer to each of the following questions.

1. You are looking for a magazine article on acid rain. Where would you look in the library to find a list of articles on this topic?

   a. card catalog
   b. computer catalog only
   c. an index to periodicals such as The Reader's Guide
   d. magazines in the Periodicals Room
   e. none of the above
   f. I don't know

2. For the item below, indicate where you would look **first** in the library to find it, and explain why:

   Taylor, Francis Henry. Fifty Centuries of Art. New York: Harper, 1960.

   a. card catalog Why?_____

   b. computer catalog Why?_____

   c. other Why?_____

   d. Inquire in Art collection Why?_____

3. For the book listed below, indicate where you would look **first** in the library to find it, and explain why:

   Naisbitt, John. Megatrends: Ten New Directions Transforming Our Lives. New York: Warner Books, 1982.

   a. card catalog Why?_____

   b. computer catalog Why?_____

   c. other Why?_____

   d. Reserve Room Why?_____

4. For the magazine listed below, indicate where you would look **first** in the library to find it, and explain why:

The Journal of Social Psychology

a. card catalog Why?_____

b. computer catalog Why?_____

c. other Why?_____

d. Periodicals Room Why?_____

5. Which of the following types of information are **not** included in the computer catalog?

a. authors' name
b. title of a book
c. length of a book
d. location of a book
e. publication year of a book
f. All of these are included in computer catalog
g. I don't know

6. The library receives many publications from the United States Covernment Printing Office in Washington, D.C.. You are looking for a document that will help you file your income tax return. Where would this document most likely be listed?

a. card catalog
b. computer catalog
c. inquire in Government Publications department only
d. all of the above
e. none of the above
f. I don't know

7. You are looking for a 1906 recording of Debussy's "Children's Corner Suite", performed by Oscar Levant. Where would you check **first** in the library to find this information?

a. card catalog
b. computer catalog
c. an index of phonograph recordings
d. Inquire in the Music library
e. all of the above
f. none of the above
g. I don't know

8. You want to look for books about a specific subject in the computer catalog. Where would you first look to determine the term or terms used to represent your topic?

   a. Library of Congress Subject Headings
   b. another book on your topic
   c. card catalog
   d. dictionary
   e. I don't know

INSTRUCTIONS

Please write brief answers to the following questions in the space provided below. You need not write full sentences.

9. You are interested in locating some books about movies in the computer catalog. You enter **s=movies** but receive the message **NO ENTRIES FOUND** . This is baffling, since movies is such a common term. State two possible explanations for this type of response, and how it could be remedied.

_____

_____

10. You have typed **a=wolfe thomas** on the terminal keyboard. What must you now do to send your search request to the computer?

_____

11. After typing the search command **a=bellow sal** , you notice you have misspelled the second word -- it should be saul. Briefly explain the three steps you would take to correct this error and send this message to the computer using the terminal keyboard:

_____

_____

_____

12. What would happen if you did not notice a spelling error and hit the ENTER key before correcting it?

_____

13. Please circle the best search command that could be used to find information about costumes using the computer catalog:

a=costume t=costume s=costume

14. What specific type of information about costumes would you expect to receive if you used each command (a=, t=, s=)?

_____

_____

_____

Your Student
Identification
Number

_____

Group
Number

_____

IMPORTANT

On the terminal before you, there is a number posted in the upper right-hand corner. Please note this number in the space below:

_____

INSTRUCTIONS

In order to help familiarize yourself with the computer catalog (if you have not used it before) and the terminal keyboard, try out each of the eight search exercises below.

You will have 8 minutes of "practice time" to work with these eight exercises.

It is not necessary for you to write anything down. For each exercise, simply locate sufficient information to enable you to find an answer to the question posed.

At the end of this 8 minute time period, you will be instructed to go on to questions 15-19 on the following pages, using the terminal. However, do not move on to these questions until you are instructed to do so. On questions 15-19, you will be asked to write in your responses.

1. Find a book by R.F. Smith titled Public Servants, Interest Groups, and Policy Making.

2. Find the call number for the Hudson Review.

3. One of Bryan Carson's books is in Northwestern's library. What is it?

4. How many books are in the computer catalog by Alvin Toffler?

5. Find The Hobbit, by Tolkien.

6. How many libraries connected with Northwestern subscribe to Training and Development Journal?

7. How many books does the library have on the general subject of the Watergate affair?

8. In what year were the first books on that subject published?

Your Student Identification Number

_____

Group Number

_____

INSTRUCTIONS

You will be using the computer catalog to answer the following questions. Please write out the answers to the questions asked here on the sheet, after you have checked them using the computer catalog terminal. **Do not go back and work on previous sections of this questionnaire.**

15. You are not sure of the exact wording of a journal title that you need for a term paper. It may be The Journal of Environmental Studies or it may be The Journal of Environment Sciences.

    a. How would you search for this in the computer catalog ?

    b. _____
    What is the correct title of this journal?

    c. _____
    Where are the current issues of the journal located?

    _____

16. You have been asked to read a book by George Kennan on U.S. Soviet relations and nuclear arms, but the professor can't remember the exact title.

    a. What is the best way to find it in the computer catalog?

    _____

    b. What is the correct title of the book?

    _____

    c. How many copies of this book are listed in the online catalog?

    _____

    d. Where are they located?

    _____

    e. What is the call number of the circulating copy in the Main collection?

    _____

17. A professor for your Contemporary Literature course has assigned a book to read. The title is something like "The 158 Pound Marriage," but he can't remember it exactly. Using the computer catalog, find out whether the library has this book, and write the correct title and the author's name below.

    _____

    _____

18. Find a case study dealing with human interaction.

    a. Write the subject term you plan to use below:

    _____

    b. Why did you choose this term?

    _____

    c. Write the title of a specific case study below.

    _____

19. You are writing a term paper on mythology, and would like to see if the library has a bibliography on this topic.

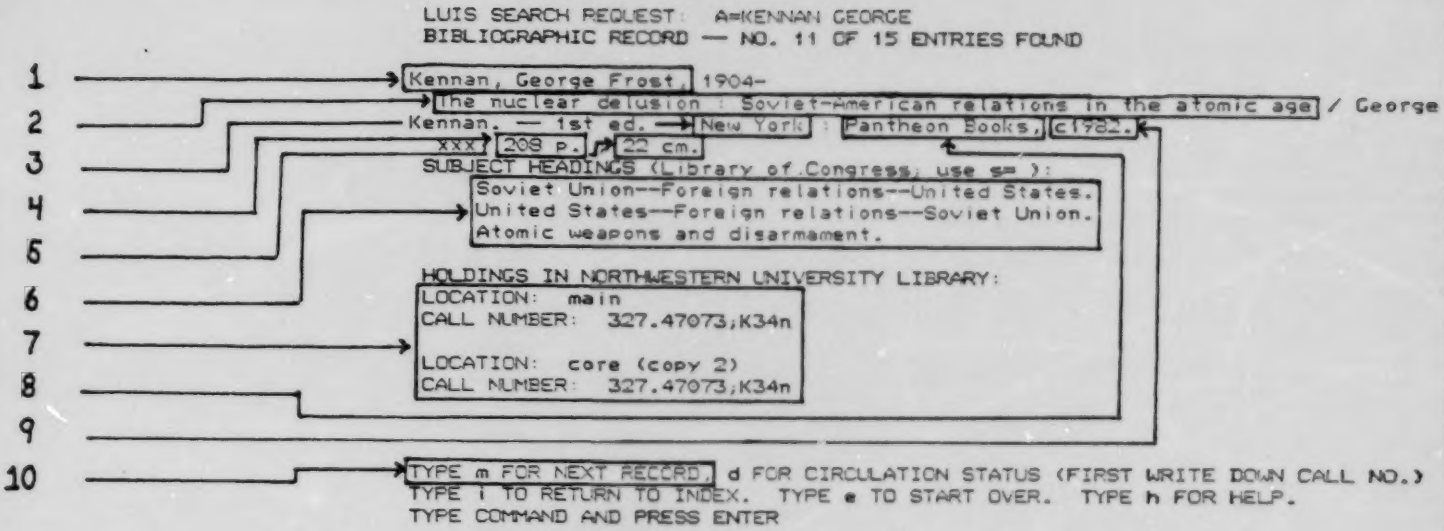
a. How would you search for a mythology bibliography in the computer catalog?

b. Write the title of a specific mythology bibliography below.

_____

_____

INSTRUCTIONS
The following section shows a paper copy of a screen display from the computer catalog. Match the numbered items on the copy of the screen with the definitions provided.


LUIS SEARCH REQUEST: A=KENNAN GEORGE
BIBLIOGRAPHIC RECORD — NO. 11 OF 15 ENTRIES FOUND
1
Kennan, George Frost, 1904-
2
The nuclear delusion : Soviet-American relations in the atomic age / George Kennan. — 1st ed. — New York : Pantheon Books, c1982.
3
xxxi, 208 p. ; 22 cm.
SUBJECT HEADINGS (Library of Congress; use s=):
4
Soviet Union--Foreign relations--United States.
United States--Foreign relations--Soviet Union.
5
Atomic weapons and disarmament.
HOLDINGS IN NORTHWESTERN UNIVERSITY LIBRARY:
6
LOCATION: main
CALL NUMBER: 327.47073;K34n
7
LOCATION: core (copy 2)
8
CALL NUMBER: 327.47073;K34n
9
10
TYPE m FOR NEXT RECORD, d FOR CIRCULATION STATUS (FIRST WRITE DOWN CALL NO.)
TYPE i TO RETURN TO INDEX. TYPE e TO START OVER. TYPE h FOR HELP.
TYPE COMMAND AND PRESS ENTER

Match the numbered items above with the definitions given below. Write the number in the space next to the definition.

---- information that tells where the book is located and what its call number is

---- height of the book

---- date book was published

---- Library of Congress subject headings that you can use in subject search to find similar books and materials on this topic

---- place where the book was published

---- instructions that help you continue searching

---- author's name

---- title of the book

---- number of pages in the book

---- publishing company

Your Student Identification Number

_____

Group Number

_____

INSTRUCTIONS

Now that you have finished this worksheet, please indicate your own views about using the computer catalog at Northwestern.

1. My overall attitude toward using the computer catalog is:
   ____ favorable _____ somewhat favorable _____ unfavorable

2. I have found that a computer catalog search by title is:
   ____ easy ____ reasonable ____ difficult

3. I have found that a computer catalog search by author is:
   ____ easy ____ reasonable ____ difficult

4. I have found that a computer catalog search by subject is:
   ____ easy ____ reasonable ____ difficult

5. I have found the directions on the terminal screens describing how to search the computer catalog:
   ____ easy ____ reasonable ____ difficult

6. I have found understanding the instructions and explanations on the screen of the computer catalog is:
   ____ easy ____ reasonable ____ difficult

7. I have found understanding the information on the screen of the computer catalog that describes a book or journal is:
   ____ easy ____ reasonable ____ difficult

8. I have found that completing this survey was:
   ____ easy ____ reasonable ____ difficult

APPENDIX FIVE: TEST TWO

NORTHWESTERN UNIVERSITY LIBRARY
COMPUTER CATALOG STUDY
QUESTIONNAIRE

TEST TWO

Northwestern University Library is conducting a computer catalog research study. The study is intended to measure the effectiveness of instructional methods based on user performance. It has been funded by the Council on Library Resources, Inc.

April, 1984

Your Student Identification Number

_____

Group Number

_____

ABOUT THIS WORKSHEET

You will not be "graded" on your answers to the following questions. So, please don't guess at answers; just mark "I don't know" or leave the question blank. If you discover an answer to an earlier question as you work through this form, please don't go back and correct your first response. We are interested in your first response to the question.

INSTRUCTIONS

In sections A and B on the following two pages, please choose the term from the lists provided that match the definitions given, and write it under the correct definition. If you are unsure about the meaning of the definition, please don't guess. Just leave the space blank.

SECTION A

The definitions in this section refer to general terms associated with computer catalogs.

database	command
LUIS	online
computer catalog	enter
terminal	dialup
cursor	search statement

1. An online file that provides access to books, journals, and other materials available in a library.

   _____

2. The piece of equipment which is used to communicate with a computer, both sending messages to it and receiving responses back.

   _____

3. The combination of a command (a=, t=, s=) with the author's name, book, or journal title, or subject term you are searching for in the computer catalog.

   _____

4. Interactive or direct communication between a user and the computer, which allows a request to be processed and the results displayed immediately on the terminal screen.

   _____

5. The name of Northwestern University's computer catalog.

   _____

6. A collection of information in machine-readable form that is accessible by a computer.

   _____

SECTION B

The definitions in this section refer to features used when searching computer catalogs.

set	subject heading guide
boolean logic	truncation
bibliographic record	help screen
datapac	subject heading
author/title index	

1. A technique used where only the first part of a word or phrase is typed into the terminal. The computer then retrieves all matching terms that begin with this phrase or partial word.

   _____

2. Information and instructions available on the terminal screen, that explain how to construct a search and use the information from a search.

   _____

3. A complete list of all authors or titles in the database that matches a search statement.

   _____

4. When more than one subject term matches a search request, the screen displays this listing of all matching search terms.

   _____

5. All the information necessary to identify a particular publication. This includes the author's name, the title of the publication, the publisher, date, number of pages, and where the item can be found in the library.

   _____

INSTRUCTIONS

In this next section, please circle the letter for the correct answer to each of the following questions.

1. You are looking for a magazine article on the nuclear arms freeze. Where would you look first in the library to find a list of articles on this topic?

   a. card catalog
   b. computer catalog only
   c. An index to periodicals such as The Reader's Guide
   d. Periodicals Room
   e. none of the above
   f. I don't know

2. For the item below, indicate where you would look first in the library to find it, and explain why:

   Covici, Pascal. Mark Twain's Humor: the Image of a World. Dallas: Southern Methodist Unversity Press, 1962.

   a. card catalog Why?_____
   b. computer catalog Why?_____
   c. other Why?_____
   d. Inquire in Art collection Why?_____

3. For the book listed below, indicate where you would look first in the library to find it, and explain why:

   Michener, James. The Covenant. New York: Random House, 1980.

   a. card catalog Why?_____
   b. computer catalog Why?_____
   c. other Why?_____
   d. Inquire in Reserve Room Why?_____

4. For the magazine listed below, indicate where you would look first in the library to find it, and explain why:

   Psychology Today

   a. card catalog Why?_____
   b. computer catalog Why?_____
   c. other Why?_____
   d. Inquire in Periodicals Room Why?_____

5. Which of the following types of information are **not** included in the computer catalog ?

____ a. authors' name
____ b. title of a book
____ c. publisher of a book
____ d. location of a book
____ e. publication year of a book
____ f. magazine articles
____ g. I don't know

6. An assignment in your Introduction to Sociology class includes looking at statistics that were compiled by the U. S. government during the last census of the United States. Where would you look **first** in the library to locate this information ?

a. ____ card catalog
b. ____ computer catalog
c. ____ inquire in Government Publications department only
d. ____ all of the above
e. ____ none of the above
f. ____ I don't know

7. Your geology professor has assigned a project that involves examining topographical map photographs from the United States Geological Survey. The professor is sure these maps page located in the library. Where would you check **first** to find these maps?

a. ____ card catalog
b. ____ computer catalog
c. ____ a world atlas
d. ____ Inquire in the Map Library
e. ____ all of the above
f. ____ none of the above
g. ____ I don't know

8. For what purpose would you use a set of books called <u>The Library of Congress Subject Headings</u>?

a. finding an article in a magazine
b. finding synonyms in a dictionary
c. searching for the term or terms used to describe a particular topic in either the computer catalog or the card catalog
d. finding the location of a book in the library
e. I don't know

INSTRUCTIONS

Please write brief answers to the following questions in the space provided below. You need not write full sentences.

9. You are interested in locating some books about **labor unions** in the computer catalog. You enter **s=labor unions** but recieve the message **NO ENTRIES FOUND.** State two possible explanations for this type of response, and how it could be remedied.

_____

_____

10. You have typed t=right stuff on the terminal keyboard. What must you now do to send your search request to the computer?

_____

11. After typing the search command a=wolf thomas, you notice you have misspelled the first word--it should be wolfe. Briefly explain the three steps you would take to correct this error and send the message to the computer using the terminal keyboard:

_____

_____

_____

12. What would happen if you did not notice the spelling error and hit the ENTER key before correcting it?

_____

13. Please circle the correct search command that could be used to find books written **by Saul Bellow** using the computer catalog:

a=Saul Bellow a=Bellow Saul t=Saul Bellow

t=Bellow Saul s=Saul Bellow s=Bellow Saul

BEST COPY AVAILABLE

14. What specific type of information **about Saul Bellow** would you expect to receive if you used each search command (a=, t=, s=) ?

_____

_____

_____

BEST COPY AVAILABLE

Your Student Identification Number

_____

Group Number

_____

IMPORTANT

On the terminal before you, there is a number posted in the upper right-hand corner. Please note this number in the space below:

_____

INSTRUCTIONS

In order to help familiarize yourself with the computer catalog (if you have not used it before) and the terminal keyboard, try out each of the eight search exercises below.

You will have 8 minutes of "practice time" to work with these eight exercises.

It is not necessary for you to write anything down. For each exercise, simply locate sufficient information to enable you to find an answer to the question posed.

When you have completed these eight exercises, you will be instructed to go on to questions 15-18 on the following pages, using the terminal. However, do not move on to these questions until you are instructed to do so. On questions 15-19, you will be asked to write in your responses.

1. Find a book by Max Weber titled Protestant Ethic and the Spirit of Capitalism.

2. Find the call number for The Journal of Etnnic Studies.

3. One of Bryan Carson's books is in Northwestern's library. What is it?

4. How many different book titles are in the computer catalog by Philip Kotler ?

5. Find The Managed Heart, by Arlie Russell Hochschild.

6. How many libraries connected with Northwestern subscribe to The Harvard Business Review ?

7. How many books does the library have on the general subject of the Vietnamese Conflict ?

8. Does the library have any books specifically about causes of the Vietnamese Conflict ?

Your Student Identification Number

_____

Group Number

_____

INSTRUCTIONS
You will be using the computer catalog to answer the following questions. Please write out the answers to the questions asked here on the sheet, after you have checked them using the computer catalog terminal. **Do not go back and work on previous sections of this questionnaire.**

15. You are reading an essay with a footnote to an article in a magazine. The footnote is abbreviated J Coll Sci Teach. You think the title is The Journal of College Science Teachers or The Journal of College Science Teaching.

a. Write the title search you would use to find this journal in the computer catalog.

_____

b. Where are the 1979 issues of the journal located?

_____

16. Your political science professor has asked you to read a very recent book by Irving Janis on psychological studies on group decision making. It has a catchy title, but he can't remember it.

a. What is the best way to find it in the computer catalog ?

_____

b. What is the correct title of the book?

_____

c. Where is it located in the library?

_____

d. How many copies of this book does the library own ?

_____

17. A Contemporary American History professor assigns readings from a book on the history of baseball, but he can't remember the exact title. It is something like "30 Years of Baseball," but he is not sure. Using the computer catalog, find out whether the library has this book, and write the correct title and the author's name below.

_____

_____

18. Search the computer catalog by subject and find the titles of two film journals owned by the library.

a. What subject term did you use in your search?

_____

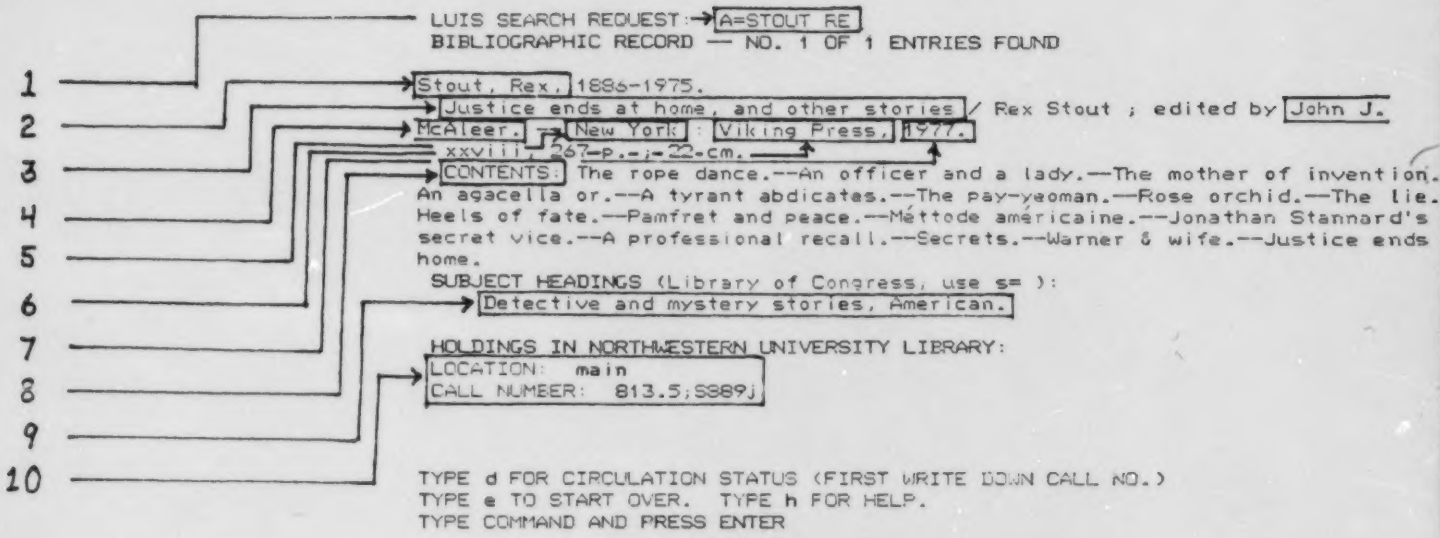
b. Why did you choose this term?

_____

c. Write the title of a specific case study below.

_____

INSTRUCTIONS
The following section shows a paper copy of a screen display from the computer catalog. Match the numbered items on the screen with the numbered definitions given below.


LUIS SEARCH REQUEST: A=STOUT RE
BIBLIOGRAPHIC RECORD — NO. 1 OF 1 ENTRIES FOUND
1
Stout, Rex, 1886-1975.
2
Justice ends at home, and other stories / Rex Stout ; edited by John J.
McAleer. -- New York : Viking Press, 1977.
3
xxviii, 267 p. ; 22 cm.
4
CONTENTS: The rope dance.--An officer and a lady.--The mother of invention.
An agacella or.--A tyrant abdicates.--The pay-yeoman.--Rose orchid.--The lie.
5
Heels of fate.--Pamfret and peace.--Méttode américaine.--Jonathan Stannard's
secret vice.--A professional recall.--Secrets.--Warner & wife.--Justice ends
home.
SUBJECT HEADINGS (Library of Congress, use s=):
6
Detective and mystery stories, American.
7
HOLDINGS IN NORTHWESTERN UNIVERSITY LIBRARY:
8
LOCATION: main
CALL NUMBER: 813.5;S889j
9
10
TYPE d FOR CIRCULATION STATUS (FIRST WRITE DOWN CALL NO.)
TYPE e TO START OVER. TYPE h FOR HELP.
TYPE COMMAND AND PRESS ENTER

Match the numbered items above with the definitions given below. Write the number in the space next to the definition.

---- Library of Congress subject heading you can use in a subject search to find similar books and materials on this topic

---- date book was published

---- place where the book was published

---- title of the book

---- search command (in shortened or 'truncated' form)

---- information that tells where the book is located and what its call number is

---- list of short stories in the book

---- name of publisher

---- editor's name

---- author's name

BEST COPY AVAILABLE

My Student
Identification
Number

_____

Group Number

_____

INSTRUCTIONS

Now that you have finished this worksheet, please indicate your own views about using the computer catalog at Northwestern.

1. My overall attitude toward using the computer catalog is:
   ____ favorable ____ somewhat favorable ____ Unfavorable

2. I have found that a computer catalog search by title is:
   ____ easy ____ reasonable ____ difficult

3. I have found that a computer catalog search by author is:
   ____ easy ____ reasonable ____ difficult

4. I have found that a computer catalog search by subject is:
   ____ easy ____ reasonable ____ difficult

5. I have found the directions on the terminal screens describing how to search the computer catalog:
   ____ easy ____ reasonable ____ difficult

6. I have found understanding the instructions and explanations on the screen of the computer catalog:
   ____ easy ____ reasonable ____ difficult

7. I have found understanding the information on the screen of the computer catalog that describes a book or journal is:
   ____ easy ____ reasonable ____ difficult

8. I have found that completing this survey was:
   ____ easy ____ reasonable ____ difficult

APPENDIX SIX: Telephone Recruitment Interview Schedule

Interview complete |_|
DATE _____
Interviewer's initials ____

I.D.(social secur.) _____

Name _____

Telephone _____

Address _____

Call Back _____

May we count on you to be part of our project?

|_| YES

|_| NO

(If YES, continue)

1. Have you ever attended a workshop or session explaining the library's computer catalog?

   |_| YES

   |_| NO

   (If YES, express appreciation, but explain that we are not including students in our study who have taken a workshop.)

   (If NO, continue with question 2.)

2. Do you have a major yet?

   (If YES) What is it?
   (If NO) Can you tell me what seems most likely will be your major, as best you can judge at this time?

   __ arts and humanities
   __ biological science
   __ education
   __ engineering
   __ physical science
   __ pre-professional
   __ social science
   __ speech
   __ journalism
   __ other

3. During the past year, have you written a computer program?
   ___ YES
   ___ NO

4. During the past year, have you completed a course using computer assisted instruction?
   ___ YES ___ NO

5. Would you be able to come in for your session at 1:00 p.m.?
   ___ yes ____ no

6. Would you be able to come in for your session at 3:00 p.m.?
   ___ yes ____ no

BEST COPY AVAILABLE

APPENDIX SEVEN:

LUIS (Library User Information Service),

A Brief Description

LUIS, Northwestern University Library's Library User Information Service, is the public access component of NOTIS (Northwestern Online Total Integrated System), which has been evolving for over a decade and is currently in version 3.4. NOTIS supports online cataloging, acquisitions, serial control, and circulation functions. Author and title access via LUIS was made public on May 5, 1980; subject access became available on March 3, 1982. On June 26, 1982, bibliographic displays expanded from a brief format to provide essentially all the information designed for general public use in MARC format records.

COMPUTER AND TELECOMMUNICATIONS

An IBM 4361, housed in the Northwestern University Library, is dedicated to NOTIS support. A technical description of the system is available in William Gray Potter and Arlene Farber Sirkin, eds., Serials Automation for Acquisition and Inventory Control (ALA, 1981), pp 140-145. Dialup access for those outside the library to LUIS for a variety of 1200- and 300-baud terminals is available to Northwestern users. The online catalog is also available throughout the campus academic computing network of 200 terminals. Leased lines provide direct access to NOTIS for the Law, Medical, a Northwestern branch library in downtown Chicago, and a seminary library in Evanston.

THE DATABASE

LUIS provides access to the NOTIS database of cataloged, ordered, and in-process materials, including current serial check-in, of the Northwestern University Library and its branches, plus a growing number of records contributed by affiliated libraries (Law, Medicine, Transportation, and the combined library of two seminaries). Over 700,000 records are now in the database, of which approximately 60,000 are serials and 12,000 are music scores and records. In addition, 50,000 to 80,000 order records are in NOTIS at any one time. Almost all serials held by Northwestern University Library are reflected in the database, as well as virtually all monographic materials received by the main library and its branches since 1970. (Cyrillic alphabet materials began to be added in 1974.) The affiliated libraries began contributing records more recently. Records are in full MARC format. At present, a separate database of all active circulation records of the main and Science and Engineering (branch) libraries is accessible to the public on the same terminals used for LUIS, via LCUS, the Library Circulation User Service. This circulation subsystem is being completely redesigned to provide circulation status directly on the LUIS interface screen. A growing file of authority records (65,000 currently) will in the future be used to provide cross references in the online catalog.

TERMINALS

Eight Telex video terminals are in the central service corridor of the main library next to the public card catalog, and three additional ones are at the end of the corridor. Twelve DEC VT100 terminals on the main floor are available for accessing either LUIS or the University's academic computers. Three Televideo TV912 terminals are placed on the Library's upper levels, adjacent to the main booookstacks. A number of other Telex and IBM 3278 terminals are accessible to the public in the following locations: Music Library (3), Science and Engineering Library (2), Geology Library, Transportation Library, Art Collection, Africana Collection, the Core Collection (an undergraduate reading room), Schaffner Library (continuing education), Law Library, and Medical Library (one each). These terminals are "locked" onto the LUIS and LCUS components of NOTIS; additional terminals in public and technical service areas provide access to other NOTIS components as well as LUIS. Portable terminals with modems have on occasion been provided to academic departments departments for dial-up access to LUIS. No printers are currently available in public areas.

RETRIEVAL FEATURES

For author or title access, either of two basic commands, "a=" or "t=", followed by a string "search term" will retrieve up to 5,000 index entries to single bibliographic records. Each index entry is composed of portions of title and author plus a publication date for monographs or place of publication for serials. A summary of the index, called a guide, is displayed if more than 17 entries match

.he search term; a single match results in direct display of a bibliographic record. Display of a bibliographic record, (in format very similar to the information found on a typical catalog card, plus providing bound volume holdings for monographs and serials, and current unbound issue holdings for serials) is accomplished by entering its associated number from the index display; a record incomplete on a single screen can be "paged" with the "enter" key. By entering "m" the next record from the index is displayed. Appropriate messages are provided for **all** on-order or in-process items.

Subject access is provided through any of three subject indexes: Library of Congress subject headings (by typing "s="), MESH headings for materials cataloged in the Medical Library (by typing "sm="), or used headings of a subject heading system developed in Northwestern's Transportation Library (by typing "st="). The immediate result of a subject search is a display of all headings and subdivisions matching the search term, up to a maximum of 5,000. This display, because of its similarity to the author/title index summary described above, is also referred to as a guide. Selection by line number of any displayed heading results in a display indexing all bibliographic records under that heading, each index line consisting of the first 35 characters of the title followed by the item's call number. Items in this index are ordered with serials first, followed by monographs in reverse chronological order. Selection by line number of any index record results in

display of the same full bibliographic record as is available for author or title searches.

Users may go from bibliographic display to index to guide and back, or to the circulation file, via a single-character command. A new search may be begun from any screen. Search terms may be right-truncated at any point, and are constructed as they would be in a card catalog search (author surnames plus forenames or initial, titles excluding initial articles, corporate names, series, etc.) Entry points comprise all those typically found in full MARC records

ASSISTANCE FEATURES

Basic online instruction is provided by a series of introductory screens, though patrons are not obliged to use any of them. The subject introductory screens provide a brief tutorial on the use of LCSH, the volumes of which are made available in all terminal areas. The most relevant commands at any point in a search are displayed with brief explanation at the bottom of every screen. No sign-on or sign-off procedure is required. Explanatory screens may be requested by the user at each step of the search and for the special condition where no index entry matches a search term. Altogether, ten introductory and seven help screens are available. Two brief printed handouts are also available for user instruction, and the Reference Department provides instruction to groups via large video monitors as well as hands-on instruction for faculty in their offices.

STATUS OF THE CATALOGS

Where sufficient terminals are available for public use, filing in existing card catalogs has been discontinued, new materials being represented only in LUIS. Older manual cards are removed from the card catalogs only when they become outdated or need correction, or when the cataloging information is placed on the database. Machine-produced cards reflecting holdings in the online database have been removed, for reasons of simplification of authority control administration. Thus, although the scope of the card catalog is gradually decreasing while the coverage of the online catalog increases, until all material in the card catalog is represented in the online database, the card catalogs will continue to be an indispensible source of information on a large segment of the collection.

APPENDIX EIGHT:

Project Bibliography

General Readings

1. Berger, Mary C. "The Endangered Species: Can Information Service Survive?" ASIS Bulletin 8 (October 1981) 12-14.

2. Council on Library Resources, Inc. "Toward the 21st Century: An Agenda for Research Libraries and Their Users." (Wingspread Conference draft summary report.) Washington, D. C.: January 1983.

3. Duchesne, R.M.; Guenter, D.A.; and Tsai, S. "Ownership of Machine-readable Bibliographic Data." Canadian Network Papers 5; National Library of Canada: March 1983.

4. Nielsen, Brian. "Teacher or Intermediary: Alternative Professional Models in the Information Age." College and Research Libraries 43 (May 1982): 183-191.

5. Paisley, William. "Electronic Information and the Library's Public: Adapting to the 'Rithms of the Future," to appear in Avency and Butler ed., Online Catalogs, Online Reference: Converging Trends. (Forthcoming).

6. Rutimann, Hans. "Computers Coming of Age in the Humanities: Rites of Passage in the Groves of Academe." (Paper presented at the International Conference on Computers in the Humanities, Raleigh, N.C. 6 June 1983. (Photocopy).

7. Waite, Robert. "Making Information Easy to Use." ASIS Bulletin 9 (December 1982).

8. Williams, Delmus E. "Evaluation and the Process of Change in Academic Libraries." In Advances in Library Administration and Organization 2: 154-174. Greenwich, CT: JAI Press 1982.

9. Dreifuss, Richard A. "Library Instruction in the Database Searching Context." RQ 21 (Spring 1982): 233-238.

10. Fjallbrant, Nancy; Kihlen, Elisabeth; and Malmgren, Margareta. "End-User Training in the Use of a Small Swedish Database." College and Research Libraries 44 (March 1983): 161-167.

11. Herndon, Gail A., and Van Pulis, Noelle. "The On-Line Library: Problems and Prospects for User Education," in New Horizons in Academic Libraries, pp. 539-544. New York: K. G. Saur, 1979.

12. Lawrence, Gail Herndon. "The Computer as an Instructional Device: New Directions for Library User Education." Library Trends 29 (Summer 1980): 139-152.

13. Lester, Ray. "User Education in the Online Age." Aslib Proceedings 36 (February 1984): 96-111.

14. McDonald, David R. and Searing, Susan E. "Bibliographic Instruction and the Development of Online Catalogs." College and Research Libraries 44 (January 1983): 5-11.

15. Ritch, Alan. "The First Three Years of MELVYL: Teaching the Tool that Teaches Itself." 1984. (Photocopy.)

16. Surprenant, Thomas T. "Learning Theory, Lecture, and Programmed Instruction Text: An Experiment in Bibliographic Instruction. College and Research Libraries 43 (January 1982): 31-37.

17. Training Users of Online Public Access Catalogs (Report of a conference sponsored by Trinity University and the Council on Library Resources, San Antonio, Texas, January 1983). Washington, D. C. : Council on Library Resources 1983.

18. User Instructions for Online Catalogs in ARL Libraries. (SPEC Kit 93). Washington, D. C.: Office of Management Studies, Association for Research Libraries, August 1983.

19. Van Pulis, Noelle. "User Education for an Online Catalog: A Workshop Approach." RQ 1 (Fall 1981): 61-69.

20. Beaubien, Anne K. Hogan, Sharon A.; and George, Mary W. Learning the Library: Bibliographic Instruction. New York: R.R. Bowker, 1982.

21. Brassil, Ellen. "Information Management Education in a New Era: Changing Skills for Librarians and Users." 1983. (Photocopy.)

22. Ellison, John, W. "Media Librarianship: Effective Library Instruction and the Learning Process." Catholic Library World 53 (November 1984): 182-184.

23. Griffin, Lloyd W. and Clarke, Jack. "Orientation and Instruction of Graduate Students in the Use of the University Library: A Survey." College and Research Libraries 33 (November 1972): 467-472.

24. Hardesty, Larry, Lovrich Jr., Nicholas P.; and Mannon, James. "Library Use Instruction: Assessment of the Long-Term Effects." College and Research Libraries 43 (January 1982): 38-46.

25. King, David, N. "Bibliographic Instruction for Research and Information Mangement." Paper presented at ACRL/BIS program of the American Library Association, Annual Conference. Los Angeles. June 1983.

26. Kirkendall, Carolyn A., ed. Reform and Renewal in Higher Education: Implications for Library Instruction. Papers presented at the Ninth Annual Conference on Library Orientation for Academic Libraries held at Eastern Michigan University, 3-4 May 1979. Ann Arbor, MI: Pierian Press 1980.

27. Kobelski, Pamela and Reichel, Mary. "Conceptual Frameworks for Bibliographic Instruction." Journal of Academic Librarianship 7 (May 1981): 73-77.

28. Lewis, David W. and Vincent, Paul C. "Reactions to ALA Think Tank." The Journal of Academic Librarianship 9 (March 1983): 4-14.

29. Lindgren, John. "Toward Library Literacy." RQ 20 (Spring 1981): 233-235.

30. Lubans, John, Jr. ed. Educating the Library User. New York: R.R. Bowker, 1974.

31. Marshall, A. P., ed. "Current Library Use Instruction." Library Trends 29 (Summer 1980).

32. Oberman, Cerise and Strauch, Katina. Theories of Bibliographic Education: Designs for Teaching. New York: R. R. Bowker, 1982.

33. Rader, Hannelore B. ed.: Library Instruction in the Seventies: State of the Art. Papers presented at the Sixth Annual Conference on Library Orientation for Academic Libraries held at Eastern Michigan University, 13-14 May. 1976. Ann Arbor, MI: Pierian Press, 1977.

34. Renford, Beverly and Hendrickson, Lennea. Bibliographic Instruction: A Handbook. New York: Neal Schuman, Inc., 1980.

35. Roberts, Anne. "The Changing Role of the Academic Instruction Librarian." Catholic Library World 51 (February 1980): 283-285.

36. Shapiro, Lillian L. "Library Instruction: A Difficult Dilemma." Catholic Library World " 53 (November 1981): 185-188.

Readings in Education and Computer Literacy

37. American Council on Education. The American Freshman: National Norms for Fall 1982. Los Angeles: UCLA Higher Education Institute, December 1982.

38. Dunn, Samuel L. "The Changing University: Survival in the Information Society." The Futurist 17 (1983): 55-60.

39. Eisele, James E, "A Case for Universal Computer Literacy." Journal of Research and Development In Education 14 (Fall 1980): 84-89.

40. Friedman, Frank L. "Computer Literacy Considered Harmful: A View from the Trenches." Interface 5 (Fall 1983): 78-79.

41. Hannafin, Michael J. "Measuring the Importance of Learning from Instruction: The Outcome Consequence Model of Evaluation." Journal of Instructional Design 6 (1983): 14-18.

42. Johnson, David C.; Anderson, Ronald E.; Hansen, Thomas P.; and Klassen, David L. "Computer Literacy--What is It?" Mathematics Teacher 73 (Feburary 1980): 91-96.

43. King, David, N. "New Educational Roles for Academic Libraries." 1984. (Photocopy.)

44. Luehrmann, Arthur. "Computer Literacy--What Should it Be?" Mathematics Teacher 74 (December 1981): 682-686.

45. Pepin, Dr. Andrew J. Fall Enrollment in Higher Education: 1978. Washington D. C. : National Center for Educational Statistics, 1978.

46. Randall, William. "Booting up For Computer Literacy." Interface 5 (Fall 1983): 88-90.

47. Vargas, Julie S. Writing Worthwhile Behavioral Objectives. New York: Harper & Row, 1972.

48. Weigand, James E., ed. Developing Teacher Competencies. Englewood Cliffs, NJ: Prentice-Hall, Inc. , 1971.

49. Wilcox, Wayne C.; Merrill, David M.; and Black, Harvey B. "Effect of Teaching a Conceptual Hierarchy on Concept Classification Performance." Journal of Instructional Development 5 (Fall 1981): 8-13.

50. Wildman, Terry M., and Burton, John K. "Integrating Learning Theory with Instructional Design." Journal of Instructional Development 4 (Spring 1981): 5-14.

51. Wilkinson, Alex Charry. Classroom Computers and Cognitive Science. New York: Academic Press, 1983.

Readings in Online Catalogs--Research and User Surveys

52. "On-Line Public Access to Library Bibliographic Data Bases: Developments, Issues and Priorities." Final report to the Council on Library Resources. Dublin, OH: OCLC and the Research Libraries Group, Inc., September 1980.

53. Public Online Catalogs and Research Libraries. (Final Report to the Council on Library Resources. Stanford, CA: Research Libraries Group, September 1982.

54. Baker, Betsy and Nielsen, Brian. "Educating the Online Catalog User: Experiences and Plans at Northwestern University Library." Research Strategies 1 (Fall 1983): 155-166.

55. Broadus, Robert N. "Online Catalogs and Their Users: A Review Article on the CLR Study of Online Catalogs." College and Research Libraries 44 (November 1983): 458-467.

56. Brownrigg, Edwin B., and Lynch, Clifford A. "Online Catalogs: Through a Glass Darkly." Information Technology and Libraries 2 (March 1983): 104-115.

57. Butler, Brett. "Online Catalogs, Online Reference: An Overview." Online Catalogs, Online Reference: Converging Trends. Proceedings of a Library and Technology Association Preconference, Los Angeles, 23-24 June 1983. Chicago, IL: American Library Association. (In press.)

58. Cheng, Chin-Chuan, and Murphy, Kurt R. "The IBM PC as a Public Terminal on LCS." Information Technology and Libraries 3 (March 1984): 62-68.

59. Cochrane, Pauline A. "Classification As A User's Tool In Online Public Access Catalogs." Syracuse University and LC-A50, Subject Access Meeting, 7 June 1982.

60. Culkin, Patricia B. "Computer Based Public Access Systems: A Forum for Library Instruction." Drexel Library Quartely 16 (January 1980): 69-82.

61. Dickson, Jean. "An Analysis of User Errors in Searching an Online Catalog." Cataloging and Classification Quarterly (Spring 1984): 19-38.

62. Gouke, Mary Noel, and Pease, Sue. "Title Searches in an Online Catalog and a Card Catalog: A Comparative Study of Patron Success in Two Libraries." Journal of Academic Librarianship 8 (July 1982): 279-291.

63. Hildreth, Charles R. Online Public Access Catalogs: The User Interface. Dublin, OH, OCLC 1982.

64. Hill, Janet Swan. "Online Classification Number Access: Some Practical Considerations." Journal of Academic Librarianship 10 (March 1984): 17-22.

65. Horny, Karen, L. "Online Catalogers: Responding to the Challenge." Canadian Library Journal 40 (October 1983): 277-283.

66. Houghton, Raymond C. Jr. "Online Help Systems: A Conspectus." Communications of the ACM 27 (February 1984): 126-133.

67. Larson, Ray R. Users Look at Online Catalogs Part 2: Interacting with Online Catalogs. Final Report to the Council on Library Resources. Berkeley, CA: Division of Library Automation and Library Studies and Research Division; 29 April 1983.

68. Larson, Ray R. and Graham, Vicki. "Monitoring and Evaluating MELVYL." Information Technology and Libraries 2 (March 1983): 93-105.

69. Mandel, Carol H. , and Herschmann, Judith. "Online Subject Access--Enhancing the Library Catalog." Journal of Academic Librarianship 9 (July 1983): 148-155.

70. Mandel, Carol A.(with the assistance of Judith Herschmann.): Subject Access In The Online Catalog. A report prepared for the Council on Library Resources. Washington, D. C. : Council on Library Resources, August 1981.

71. Markey, Karen. Online Catalog Use: Results of Surveys and Focus Group Interviews in Several Libraries. Final report to the Council on Library Resources, Volume II. Dublin, OH: OCLC, 1983.

72. Markey, Karen. "Offline and Online User Assistance for Online Catalog Searchers." Online 8 (May 1984): 54-66.

73. Masters, Deborah C. "How Will the Online Catalog Affect the Reference Function?" Paper presented at the New England Chapter ACRL Conference, 19 March 1982.

74. Matthews, Joseph R. A Study of Six Online Public Access Catalogs: A Review of Findings. Final Report to the Council On Library Resources. Washington, D. C.: Council on Library Resources, November 1982.

75. Matthews, Joseph R. Public Access to Online Catalogs: A Planning Guide for Managers. Weston, CT. : Online, Inc. 1982.

76. Matthews, Joseph; Lawrence, Gary; and Ferguson, Doug. Using Online Catalogs. New York: Neal-Schuman, 1983.

77. McCarn, Davis B. Online Catalogs--Requirements, Characteristics, and Costs. Conference Report. New York: Online Information International, Inc., December 1982.

78. Micciche, Pauline F. "Staff Training for On-line Processing Systems." Dublin, OH: OCLC, May 1978. (ED 167 174):

79. National Library of Canada Canadian Network Papers (October 1983): R-26

80. Nielsen, Brian. "An Unfolding, Not An Unveiling: Creating an Online Public Catalog." Library Journal 109 (15 June 1984): 1214-1218.

81. Nielsen, Brian. Online Reference and the "Great Change" (Presented at the LITA Preconference, Los Angeles, 23-24 June 1983.

82. Nitecki, Danuta A. "Opinions Toward Automated Information Retrieval Among Reference Librarians: A National Survey." M. A. dissertation, University of Tennessee, Knoxville, 1976.

83. Packer, Katherine H. "User Reactions to the Microcatalogue: Implications for the Design of Online Catalogues." In Proceedings of the "Alumni-in-Residence Program." Ann Arbor MI: University of Michigan 1981. (Pamphlet.)

84. Pease, Sue, and Gouke, Mary Noel. "Patterns of Use in and Online Catalog and a Card Catalog." College and Research LIbraries (July 1982): 279-291.

85. Post, W. P., and Watson, P. ed. Online Catalog: The Inside Story. Chico, CA: Ryan Research International 1983.

86. Price, Bennett, "Terminals for a User-Friendly Library System." Information Technology and Libraries 2 (March 1983): 87-93.

87. Pritchard, Sarah M. Scorpio: A Study of Public Users of the Library of Congress Information System. Washington, D. C. : Library of Congress, January 1981.

88. Richards, Timothy F. "The Online Catalog: Issues in Planning and Development." The Journal of Academic Librarianship 10 (1984): 4-9. 1984

89. Salmon, Stephen. "Experiments In The On-Line Catalog: The Story Up To Now." Paper presented at an American Library Association preconference, Philadelphia, PA 1982.

90. Siegel, Elliot R. , Karen Kameen, Sally K. Sinn, and Frieda O. Weise. Research Strategy and Methods Used to Conduct A Comparative Evaluation Of Two Prototype Online Catalog Systems. Bethesda, MD: National Library of Medicine, April 1983.

91. Siegel, Elliot R. , Karen Kameen, Sally K. Sinn, and Frieda O. Weise. "A Comparative Evaluation of the Technical Performance and User Acceptance of Two Prototype Online Catalog Systems." Information Technology and Libraries 3 (March 1984): 35-46.

92. Taylor, Arlene G. "Authenticity Files in Online Catalogs: An Investigation of Their Value." Revision of a paper presented at the meeting of Technical Services Directors of Large Research Libraries Discussion Group, American Library Association Annual Conference. Los Angeles, CA: June 1983.

93. University of California Division of Library Automation and Library Research and Analysis Group. Users Look at Online Catalogs: Results of a National Survey of Users and Non-Users of Online Public Access Catalog. Final report to the Council on Library Resources. Berkeley, CA: 16 November 1982.

94. Using Online Catalogs: A Nationwide Survey. Report of a Study sponsored by the Council on Library Resources. New York: Neal-Schuman 1983.

Research Methodology

95. Abrera, Josefa B. "Bibliographic Structure Possibility Set: A Quantitative Approach for Identifying Users' Bibliographic Information Needs." Library Resources and Technical Services. 26 (January-March 1982): 21-36.

96. Borgman, Christine L. "The User's Mental Model of an Information Retrieval System: Effects on Performance." Ph. D. dissertation, Stanford University 1983.

97. Borgman, Christine L. "Mental Models: Ways of Looking at a System." ASIS Bulletin 9 (December 1982): 38-39.

98. Campbell, Donald T. and Julian C. Stanley. Experimental and Quasi-Experimental Designs for Research. Chicago: R. McNally, 1966.

99. Gagne, Robert M., and Briggs, Leslie J. Principles of Instructional Design. 2nd ed. New York: Holt, Rinehart, and Winston, 1979.

100. Kidder, Louise H. Research Methods in Social Relations. New York: Holt, Rinehart and Winston 1981.

101. Krikelas, James. "Information-Seeking Behavior: Patterns and Concepts." Drexel Library Quarterly 19 (Spring 1983): 5-20.

102. Larson, Ray R. Preliminary Specifications for the Statistical Data Collection and Evaluation Facilities of the Prototype On-Line Catalog. Berkeley, CA: Division of Library Automation, Office of the Assistant Vice President for Library Plans and Policies; October 1980.

103. Eokho, Steven. "A Study of Data Elements for the COM Catalog." Journal of Library Automation 12 (March, 1979): 94-97.

104. Watt, Dan. "Mind-Mirroring Software." Popular Computing 2 (October 1983): 65-68.

System Monitoring Research

105. Borgman, Christine L. End User Behavior on the Ohio State University Libraries' Online Catalog: A Computer Monitoring Study. Dublin, OH: OCLC 1983.

106. Johnson, Millard F., Jr. "An Analysis of the Log of an Online Public Access Catalog." St. Louis: Washington University School of Medicine Library 1983. Photocopy.

107. Kern-Simirenko, Cheryl. "OPAC User Logs: Implications for Bibliographic Instruction." Library Hi Tech 1 (Winter 1983): 27-35.

108. Meadow, Charles T. "A Study of User Adaptation to an Interactive Information Retrieval System." Dublin, OH: OCLC, 15 July 1983.

109. Penniman, W. D., and Dominick, W. D. "Monitoring and Evaluation of

On-Line Information System Usage." Information Processing and Management 16 (1980): 17-35.

110. Rice, Ronald, E., and Borgman, Christine L. "The Use of Computer-Monitored Data in Information Science and Communication Research." Journal of the American Society for Information Science 34: 247-256.

111. Tolle, John E. Current Utilization of Online Catalogs: Transaction Analysis. Dublin, OH: OCLC, 1983.

APPENDIX NINE: Project Reporting Activities

Papers Presented

"Integrating User Instruction for Online Catalogs with Traditional Library Services." Paper presented at North Suburban Library System Program, Wheeling, Illinois, October 4, 1983.

"Educating the Online Catalog User: Project Update." Paper presented at RASD Program "Communicating Effective Use of Online Catalogs", American Library Association Conference, Dallas, Texas, June 23, 1984.

"Optimizing System Monitoring Facilities for Online Catalog Instruction: Discussion of an Online Catalog Instruction Model". Paper presented at Integrated Online Library Systems Conference, Atlanta, Georgia, September 13, 1984.

"Online Catalog Instruction: The Theory and the Practice". Paper to be presented at ACRL Bibliographic Instruction Section Program, American Library Asssociation Annual Conference, Chicago, Illinois, 1985.

Papers Published

"Educating the Online Catalog User: Experiences and Plans at Northwestern University." Research Strategies, 1 (Fall 1983): 155-166.

"Learning More About LUIS: Northwestern University Computer Catalog Experiment," Undergraduate Forum: A University Library Newsletter for Northwestern Students, (Fall 1984) p.1. (Newsletter is distributed to all undergraduate libraries in the United States)

Other Presentations

"Educating the Online Catalog User," colloquium sponsored by the Graduate Library School, University of Chicago, February 7, 1984.

"Educating the Online Catalog User: Project Results," University of Wisconsin Library, December 12, 1984.

APPENDIX TEN:

Summaries of Meetings with Librarians at Northwestern University, the University of Wisconsin-Madison and Washington University

Northwestern University--Washington University
Discussion of Content of an Online Catalog User Education Program
August 17, 1983

Northwestern staff members: Betsy Baker, Brian Nielsen, Melanie Dodson, Beth Sandore.
Washington University staff members:

Eileen Horn	Chemistry librarian
Lori Calcaterra	Head, Sciences/Engineering Service
Deborah Hartwig	Earth and Planetary Sciences Librarian
Carol Iglauer	Sciences/Engineering Librarian
Imre Meszaros	Head, Humanities Services
Jeff Huestis	Head, Library Data Processing Services
Renata Rotkowicz	Director, Public Services and College Development
Terry Keegan	Social Sciences Librarian
B. J. Johnson	Social Science/Government Publications
Kay Shehan	Social Sciences Librarian
Vicky Witte	Head, Social Sciences Services

Introduction

Opening remarks were made by Brian Nielsen, who stated that the focus of the meeting would be a discussion of what the content of a bibliographic instruction program might include. Nielsen briefly outlined the Northwestern Universtiy CLR grant, and noted that the NU group is now formulating a set of generalized learning objectives for a bibliographic instruction workshop designed to teach users how to search an online public access catalog.

Originally, the NU group had planned to use this discussion forum in the same manner as that which took place the previous week at Madison, where specific points of the learning objectives draft were discussed. The previous week's meeting results were formulated into another more cohesive draft of learning objectives. This helpful refining process brought to light a key issue in the learning objectives, however, that the group agreed merited further focused discussion and input from the meeting at Washington University. This issue involves what technical and logical aspects of the structure of an online catalog system will be explained to users, e.g., the question of how much must a user understand about file structure and the workings of information retrieval, in order to successfully use an online catalog. Also, in what manner and to what depth should such an explanation be incorporated as a learning objective in a bibliographic instruction program for teaching use of an online catalog?

Learning Objectives For Educating the Online Catalog User

Betsy Baker provided an overview of learning objectives for use in an online catalog user education program and comments were invited. The NU group believes Washington University librarians might be particularly helpful at identifying instruction needs of public users; as LUIS has recently been installed in the Washington University Library, the staff will have had a "fresh" opportunity to observe users with difficulties using terminals, and may be able to provide the NU group with some insights on this matter.

LUIS Instruction

Baker described preliminary LUIS bibliographic instruction activities from 1982 to present. She then outlined general points of the NU CLR proposal, including a description of a general timetable of program activities for the next year. She pointed out that the impetus behind the grant proposal idea centered around the NU library staff's realization that diverse user instruction needs were not being met solely by use of online LUIS instructions. Patrons' repeated requests for staff assistance in using LUIS, the 1982 pilot program of LUIS workshops, and informal examination of transaction logs that revealed LUIS help and instructional screens were rarely used, confirmed the need for a well-planned and implemented instruction program for using the online catalog.

She outlined a general plan of events for next year's development of the bibliographic instruction program as follows:

1. Develop a generalizable instruction model for teaching online catalog use, to be achieved in the following manner:

    A. Use of a behavioral framework for developing instructional objectives in order to focus on teaching specific points by listing them as separate learning objectives.

    B. Teaching, in the most general sense by incorporating diverse methods -- the use of an online catalog, using help screens, workshops, printed brochures, terminal guides, etc.

2. Present this bibliographic instruction program at NU during the 1983-84 school year.

3. Evaluate the program using, among other methods, LUIS transaction logs, to measure performance and learning in a situation as close to normal use of an online catalog as possible

4. Determine the effectiveness of using transaction logs for analysis of online catalog user performance

LUIS Workshops

Melanie Dodson presented a recap of the content of current LUIS workshops taught at NU. The main points of the 50-minute session are as follows:

A. Presentation of card catalog/online catalog analogy

B. Explanation of holdings in online catalog (scope of the system), and holdings in the card catalog--similarities and differences

C. Introduction to types of screens--help, instructional, etc.

D. Search command steps

E. Manipulating information to retrieve desired record, etc.

Classroom demonstrations are given in a room with one terminal and three 21" video monitors that may be used to display terminal screen.

She reiterated the point that the need for further LUIS instruction was determined by the fact that users were not calling up help screens when attempting to search the database; also, the reference staff giving on-site assistance to patrons observed that minor errors and misunderstandings, e.g., punctuation rules, misspellings, author inverted names, etc., were preventing users from effectively accessing the system. Without a good working knowledge of these fundamentals, Dodson noted that users are unable to do more efficient, effective searching. In addition, patrons are unable to use more powerful retrieval methods.

Plans for the Fall LUIS program at NU include the following:

1. On-site demonstrations at public terminals to promote interest in workshops

2. LUIS 50-minute workshops

Washington University Experiences

A general discussion/question session followed with Washington University staff asking questions on specific points regarding operation of the NOTIS system.

It was noted that LUIS terminals at Washington University Library are located within sight of the main reference desk, while at Northwestern University they are not. Most of the members of the Washington University reference staff have had the opportunity to observe patrons using the LUIS terminals. They have noted that it is difficult to determine whether a patron needs assistance using LUIS, as users do not seem to display facial expressions of frustration or satisfaction when using the LUIS terminals. This, they note, is in sharp contrast to observations of users at the card catalog, who, by and large, exhibit facial expressions that are more indicative of their success (or lack thereof) with information retrievel.

Washington University's installation of LUIS has been programmed to provide a bell signal with each error message. Though this was an oversight and will be changed, the bell has been available as a signal to public services staff that users were having problems.

The WU reference staff has also noticed a marked increase in use of LCSH, which was corroborated by the NU group.

The NU group also noted that the WU staff may experience a marked increase of users requesting LUIS lookups via the telephone. Impressionistic observation at Northwestern has been that there has been an increase, possibly due to the Library's ability to respond much faster to catalog lookup questions. Whereas an "unwritten policy" at NU had been to limit lookups to three per caller before LUIS was available, there is no such limit now.

Also, the NU group noted that WU staff members may encounter outside users (those not directly associated with the university) who request lookups and on-site assistance in accessing LUIS. This can be a frustrating problem, because whereas Northwestern users are motivated to learn the use of LUIS, outsiders see themselves as one-time or strictly occasional users and seem not to have this motivation to become more self-sufficient.

The WU staff noted that their LUIS system includes holdings from 1980 on, and backup cards are still being filed in their card catalog. The WU LUIS system does not yet have full record display, but that is anticipated soon.

Online Catalog Instructional Issues

A general discussion of instructional issues was the final agenda item of the meeting.

The central topic was how much theory regarding system structure ought to be included in an instructional workshop. Points in this issue include the following considerations:

The system: How it works vs. what it's for (theory vs. practicality)

1. Do patrons need to understand the relationship between indexing and bibliographic records in an online catalog system? If so, how much information do we need to teach?

2. The LUIS system structure, being fairly simple, may not require much explanation of file structure in order for patrons to operate it. There are, however, more complex systems (e.g., NLS/Madison) where features such as Boolean searching and set construction may require some initial discussion of indexing and file structure.

3. Even minimal information about file structure and system indexing has a general application for patrons who will use other online catalogs or computer systems in general.

During the discussion, a number of questions were raised and comments made concerning particular problems of searching an online catalog. The overall concern of both staffs was that the content of an instructional program include an explanation of these problems. Also, the nature of the questions raised hinted that users might actually better understand these problems with some basic knowledge of how a system operates. Questions and comments from this session appear below:

1. Does a user understand that when you search the title file on LUIS, other files (i.e., author, subject) are not being searched, and he/she might be missing information?

2. "Masked operations" sometimes prevent users from diagnosing searching errors--e.g., a keyword search of a record sometimes brings up the brief form, which may or may not include the key that resulted in the retrieval. How will the user know that he/she needs to consult the full record display for information that may, for instance, be in the tracings, without some understanding of file structure?

3. By teaching structure are we liable to the old charge about BI that librarians are teaching too much, and that it is not appropriate to give users a course in library science?

4. Are we teaching users too much superfluous information that may ultimately confuse instead of help them?

5. A number of comments were made to the effect that some basic information about the structure of a system is integral to learning the workings of an online system, the main points of which follow:

A. The more complex the system, the more important a discussion of structure becomes in an instructional program.

B. It is especially important for librarians to understand system structure, in order to a) interpret user problems, and b) communicate user needs to systems design staff.

C. A very thought-provoking comment was made by Washington University head of Humanities Services, Imre Meszaros, regarding the analogy between teaching use of the card catalog and the online catalog. Users read the card catalog at various levels -- some are interested in simply author, title, and call number, while others utilize extensive information -- collection, tracings, imprint date, etc. All of this information, however is made available in card catalog instruction, and users take away only the information they need. Meszaros noted this is similar to levels of reading Shakespeare -- readers have the full text, and each reader achieves a different level of understanding of that text. So it ought to be with online catalog instruction -- the information ought to be available to users, as they will ultimately choose how much of it to incorporate into their own scheme of understanding.

Northwestern University Library
Reference Department

Discussion of Learning Objectives for
Educating the Online Catalog User
August 25, 1983

Introduction

Prior to this meeting of the NUL Reference staff, several drafts of the learning objectives had been routed in the department. During this time, there had been considerable discussion among staff members, resulting in helpful comments and suggestions, many of which were incorporated in succeeding drafts. Since reference staff members were familiar with the learning objectives and the goals of the CLR online catalog instruction project, the meeting discussion was a culmination of considerable prior reflection about, and experiences with LUIS instruction.

General Comments About Learning Objectives

The reference staff was generally satisfied with the learning objectives in their present form (terminology aside), and did not believe they were too system specific. There was a group consensus that the logical sequence of this latest draft of learning objectives required no further revision (additional work on T2 is still underway). The staff agreed that the terminal objectives represented all aspects of the logical steps a user goes through in learning to use the online catalog. It was also agreed that the "general objective" was a reasonable and realistic goal. It was acknowledged that the objectives were intended to represent an ideal state and that it may not be possible to cover all enabling objectives in a 50-minute LUIS instructional session. It was suggested that it may be possible and desirable to prioritize the objectives, thus ensuring that the most important elements not be excluded due to time constraints. It may also be desirable to provide a separate set of objectives for advanced online catalog education.

While both terminal and enabling objectives were reviewed point-by-point in the staff meeting, discussion focused on the rationale behind the objectives themselves, and specifically on T2, which deals with the user's understanding of the structure of an online system.

Teaching The Structure Of An Online Catalog

This portion of the discussion opened with the question of whether it is necessary to teach online system structure in an instructional session. The group seemed to gravitate toward a consensus that teaching structure should be included in the

objectives. It was felt that a brief overview of the system is helpful in conceptualizing the system and that teaching structure by example may be most illustrative and effective. General information (that is not system specific) learned about file structure and indexing may be generalizable to other systems. The staff felt that it is important that public service librarians be conversant in matters dealing with the structure of online systems and that a present lack of familiarity may be contributing to the negative feeling some librarians have about teaching the matter of structure to users.

Discussion On Use of Behavioral Basis for Stating Objectives

There was a considerable amount of discussion regarding the use of a behavioral framework for writing learning objectives, particularly the concept of using "action verbs" to elicit user performance, which demonstrates that the user has actually learned the skills and concepts taught in the instructional activity. Some staff members believed it would be sufficient to state that users have gained a passive knowledge of catalog operations. Another similiar suggestion was that the user simply be able to describe the general operating features of the online system, rather than demonstrating their functions. It was explained that the group had decided to use a behavioral framework for establising learning objectives in order to elicit measurable performance from users, which is a necessary part of the evaluation component of the project. The user's demonstration of a successful search is the only way of evaluating whether he/she has internalized what has been taught. It is also an indication that the user can coordirate cognitive skills with motor skills to operate the terminal keyboard and perform a search.

Northwestern University -- University of Wisconsin/Madison
Discussion of Content of an Online Catalog User Education Program
August 12, 1983

Northwestern University staff members: Betsy Baker, Brian Nielsen, Melanie Dodson, Beth Sandore.

University of Wisconsin/Madison staff members: Donna Senzig (Acting Director, College Library), Priscilla Neil (Head, Interlibrary Loan Services).

Introduction

Brian Nielsen introduced the discussion by emphasizing that the main objective of the collaboration sessions between Northwestern and Madison is to examine similar and differing instructional issues involved in user education programs for LUIS and NLS.

Betsy Baker reviewed the meeting agenda, noting the draft learning objectives would be a primary area for the meeting's discussion.

CLR Proposal and Project

Next, Baker provided a brief review of the development of the proposal for the CLR grant. One of the main objectives of the project is to develop an evaluation method that incorporates both system analysis concerns and public services concerns.

Additional activities that have been carried out since the acceptance of the proposal include:

1. Spring, 1983 LUIS workshops--viewed by the Reference staff as pilot sessions--helped them gain insights for the actual project workshops.

2. A news release highlighting the Northwestern proposal was written and circulated at ALA/Los Angeles. In addition, it is slated to appear in a number of publications.

3. Two consultants have been chosen to analyze transaction log data to determine whether appropriate evaluative information can be assessed for the BIS project: Charles McClure and Christine Borgman.

4. Ongoing documentation of our activities for the Council on Library Resources concerning development of online user education at Northwestern University Library.

University of Wisconsin Experiences

Donna Senzig of Madison gave a demonstration of the NLS system. She also described the recommendations of the User Education Committee at Madison (now defunct) concerning user information needs within that system. This included a priority list: 1) terminal placement; 2) staff training; 3) public relations -- throughout the whole university; 4) training programs for training BI librarians and training users; 5) preparation for "wider community" access, i.e., interested members from other libraries, etc. -- this involves planning for functional teaching/demonstration rooms and areas within the library.

The recommendation of the User Education Committee was that a position be established within the library system that would encompass the coordination of the above-mentioned objectives within the Madison libraries system. Senzig will send a job description for this position to NU.

Online Catalog Instructional Issues

Nielsen posed the question--"How much instruction can be included as part of the user interface in an online public access catalog?"

Senzig discussed the NLS prospective approaches to this question by outlining the following points, on which she has collaborated with the University of Chicago Regenstein Library staff:

1. A menu screen approach to explain commands and searching was considered too limited.

2. NLS' main objective for online catalog instruction was for simple command language and screen designs. This reasoning is based on the fact that NLS will be used by patrons who possess various levels of understanding with regard to operating an online catalog, ranging from first-time users, undergraduates with little or no library research experience, to Ph.D. students who have done complex and extensive research, and also those with computer orientation.

3. Even the simplest online systems still require formalized instruction before both patrons and staff can use them effectively. Excessive design of "help" screens, menus, and other extensive online instructions may actually be counter-productive, since users may not wish to spend the time reading them. Also, in flipping from an incorrect command to a help screen for assistance, the user loses the error screen, and consequently may forget that error and repeat it in the correction attempt. She cited Ohio State University's LCS system as an example of an online catalog

with extensive help screens. To avoid this, Senzig advocated providing a printed reference manual at the terminal, which allows the user to interpret an error message and correct it while still displayed on the screen.

There followed a demonstration of the NLS system for the NU librarians conducted by Senzig. Much of the user interface in that system remains to be written and implemented, as Wisconsin staff prefer to get more experience with the search features of the system first, and also learn from student experience with the system in the College library.

Following the demonstration, there was a group discussion about the similarities and differences between the NLS and LUIS systems, focusing on what aspects of each system were important topics in an instructional program. The group agreed that there are a number of more complex features of the NLS system that a LUIS-specific instructional program would not have to incorporate into a teaching session (e.g., Boolean, set combining, the use of key words, and explicit truncation). The group agreed, however, that a set of general objectives must be flexible enough to encompass the teaching needs of any online system.

Senzig emphasized the Madson User Education Committee's consensus that the online user instructional interface be minimal. The committee initially prefers to develop instructional flyers with only basic commands and search strategies for the NLS system. No immediate plans are being formulated for teaching use of the more powerful retrieval commands of the system.

Fall plans for the NLS system were outlined by Senzig as follows:

1. Approximately five terminals will be available in the near future for public access throughout the Madison libraries on campus, but exact planned locations were not known.

2. Bibliographic instruction classes and tours, would include a mention of the NLS online catalog, with a basic explanation and introduction.

3. Current BI plans for Fall do not include any targeted NLS training, due to lack of staff time and uncertainty as to the placement of terminals. She did note, however, that instructional objectives, when they are implemented, will center on very basic types of uses of NLS, e.g., author, title, subject searches and obtaining circulation information.

A discussion about how to publicize online catalog instructional sessions began, whereupon Baker outlined Fall plans for LUIS workshops and library orientation at Northwestern University

Library. She noted that this includes workshops (single-session) targeted for undergraduates. Campus contacts are made via letters to dormitory advisors, faculty members, announcements in the student handbook, and posters and flyers located in the Library and throughout the campus.

Melanie Dodson explained the development of LUIS workshops, which began in Spring quarter of 1982. She noted that letters sent out to the faculty concerning the availability of the workshops elicited favorable responses. Also, in anticipation of the 1983-84 program, she and Betsy Baker, with the assistance of other members of the reference staff, have re-designed and codified the LUIS workshop session format. The staff agreed that the Spring, 1983 workshop teaching, promotional program, and questionnnaire results (although sparse), have provided valuable experience that will be incorporated in the 1983-84 CLR project plans.

Some objectives noted for the coming year were as follows:

1. More hands-on experience provided for students in workshop sessions

2. Incorporating this increased use of terminals with use of the video monitors, so that students see not only screen displays, but are also aware of what is being done at the terminal to produce the screen displays.

A lengthy discussion and suggestion session followed, the topic being a draft of the online catalog instructional program learning objectives. The results of this discussion were incorporated into a written revision of the learning objectives draft.